RNS Institute of Technology, Bengaluru

(AICTE Approved, VTU Affiliated, NAAC 'A' Grade Accredited)

UG Programs - CSE, ECE, ISE, EIE and EEE have been Accredited by NBA for the Academic years 2022-23,2023-24 and 2024-25

ESTD : 2001

2.6 INDEX SHEET
CO,CO-PO Mapping of all Departments

SLNO	Particular	Page no
1	CO,CO-PO Mapping CSE DEPARTMENT	1-502
2	CO,CO-PO Mapping CV DEPARTMENT	503-574
3	CO,CO-PO Mapping ECE DEPARTMENT	574-649
4	CO,CO-PO Mapping EEE DEPARTMENT	650-730
5	CO,CO-PO Mapping EIE DEPARTMENT	731-932
6	CO,CO-PO Mapping ISE DEPARTMENT	933-986
7	CO,CO-PO Mapping ME DEPARTMENT	987-1052
8	Attainment Calculation for ME	1053-1143

****

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15MAT31- ENGINEERING MATHEMATICS- III

	Justification:	Program Outcomes										
Co/po	**PO1**	**P02**	**P03**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	3	2	1		1		1	1		3
CO2	3	3	3	2	1		1		1	1		3
CO3	3	3	3	2	1		1		1	1	2	3
CO4	3	3	3	2	1		1		1	1	2	3
CO5	3	3	3	2	1		1		1	1	2	3

COs	POs	CRL	**Justification**
CO1	PO1	3	Apply the knowledge Numerical methods to get solutions approximatelty for complex problems
	PO2	3	Apply the knowledge of Calculus in complex engineering problems
	PO3	3	Moderatly applied in development of solutions
	PO4	2	Used in research-based works
	PO5	1	Used to create programs to solve the complex problems
	PO7	1	understand the professional engineering solutions in environmental context
	PO9	1	the complex engineering problems allows students to effectively participate to work in teams

	PO10	1	used in writing reports effectively in a systematic manner
	PO9	1	the complex engineering problems allows students to effectively participate to work inteams
	PO12	3	To engage in independent in the broadest context in technological changes.
	PO10	1	Strongly used in writing reports effectively in a systematic manner
	PO1	3	Apply the knowledge of Bessel's DE in Electrical engineering
	PO11	2	Partially applied
	PO2	3	Apply the knowledge of Calculus in complex engineering problems
	PO12	3	Recognize and preparation and ability in learning lifelong processes
	PO3	3	Moderately applied in development of solutions
	PO1	3	Apply the knowledge of probability theory in real life problems to predict the future
	PO4	2	Used in research based works
CO2	PO2	3	helps students to analyse the problem effectively in engineering.
	PO5	1	Used to create programs to solve the complex problems
	PO3	3	Seldomly used in development of solutions
	PO7	1	understand the professional engineering solutions in environmental context
	PO4	2	used in real world problems
	PO9	1	the complex engineering problems allows students to effectively participate to work inteams
CO4	PO5	1	Apply the recent techniques in complex engineering activities
	PO10	1	used in writing reports effectively in a systematic manner
	PO7	1	study the professional engineering solutions in research area
	PO12	3	To engage in independent in the broadest context in technological changes.
	PO9	1	the complex engineering problems allows students to effectively participate to work inteams
	PO1	3	Apply the knowledge of poles, singularities in Fluid Mechanics
	PO2	3	Apply the knowledge of Calculus in complex engineering problems
	PO10	1	Strongly used in writing reports effectively in a systematic manner
	PO3	3	Seldom used in development of solutions
	PO11	2	Strongly applied
	PO4	2	complex analysis is extensively used in flow problems that arises in fluid mechanics
CO3	PO12	3	Highly applied to engage in independent in the broadest context in technological changes.
	PO5	1	Complex problems can solved by using moderns tool softwares
	PO7	1	study the professional engineering solutions in research area

CO5	PO1	3	Apply the knowledge of sampling theory for testing the hypothesis to accept or reject the given data
	PO2	3	Apply the knowledge of sampling theory for testing the hypothesis to accept or reject thegiven data
	PO3	3	Apply the knowledge of sampling theory for testing the hypothesis to accept or reject thegiven data
	PO4	2	Students can apply statistical method to solve complex engineering problem andmathematical modelling
	PO5	1	Students can apply statistical method to solve complex engineering problem andmathematical modelling
	PO7	1	Students can apply statistical method to solve complex engineering problem andmathematical modelling
	PO9	1	the complex engineering problems allows students to effectively participate to work inteams
	PO10	1	Understand the concepts of mathematics and apply it to their work as a member or leaderin a team to manage the projects
	PO11	2	Understand the concepts of mathematics and apply it to their work as a member or leaderin a team to manage the projects
	PO12	3	The students will become aware of the need for life long learnibg and the continuedupgrading of technical knowledge in application of numerical calculus

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS32 -ANALOG & DIGITAL ELECTRONICS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Analyse the performance of FETs, Opamp circuits and their applications.	2	2	2								1	1	2			
CO2	Apply simplification (SOP/POS) techniques to combinational logic circuits/expressions.	3	2	3	2	1						1		2	1	1	
CO3	Analyze and design various data processing circuits .	3	3	2	2							1	1	2	2	1	
CO4	Realize the working of various flip flops and their applications.	2	2	2	2							1	1	2	1	1	
CO5	Interpret and analyze the performance of A/D and D/A converters.	2	1	1									1	1	1	1	
CO6	Implement logic circuits using HDL models	2			1	2							1	1	2		

	PO	Level	Justification
CO1	PO1 PO2 PO3	Maps moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to moderately understand the working of FETs and Opamp circuit to analyse their performance. Also provide design solution for the given specification for certain applications.
	PO11 PO12	Maps slightly	Students can manage to do projects using opamps in multidisciplinary environment to a slighter extent and provides scope for career development leading to lifelong learning.
CO2	PO1 PO3	Maps substantially	The knowledge of mathematical principles and basics of science will help the students to apply the same to substantially understand the simplification techniques pertaining to combinational logic and will be able to design logic circuits for the given SOP POS function.
	PO2 PO4	Maps moderately	Student will be able to apply first principles of mathematics and science to moderately analyse and verify the combinational logic problems.
	PO5 PO11	Maps slightly	Students can use modern tools to simulate combinational logic circuits and manage to do projects using combinational logic in multidisciplinary environment to a slighter extent.
CO3	PO1 PO2	Maps substantially	The knowledge of mathematical principles and basics of science will help the students to apply the same to substantially analyze certain data processing circuits
	PO3 PO4	Maps moderately	Student will be able to apply first principles of mathematics and science to design few data processing circuits to a moderate extent and also can verify certain design problems pertaining to few data processing circuits.
	PO11 PO12	Maps slightly	Students can manage to do projects using data processing circuits in multidisciplinary environment to a slighter extent and get scope for career development leading to lifelong learning.
CO4	PO1 PO2 PO3 PO4	Maps moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to moderately understand and verify the working of various flip flops, analyze their functionality in certain applications like registers and counters and will be able to design sequential circuits for the given specification to a moderate extent.
	PO11 PO12	Maps slightly	Students can manage to do projects using sequential logic circuits in multidisciplinary environment to a slighter extent and get scope for career development leading to lifelong learning.
CO5	PO1	Maps moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to moderately analyze the performance of certain A/D and D/A converters.
	PO2 PO3 PO12	Maps slightly	Student will be able to apply first principles of mathematics and science to analyze the working of certain A/D and D/A converters and also design few A/D converters to do projects in multidisciplinary environment to a slighterextent.
CO6	PO1 PO5	Maps moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to moderately understand the various HDL models and implement certain logic circuits using VHDL/Verilog HDL aidedby modern simulation tools like xilinx.
	PO4 PO12	Maps slightly	Student will be able to verify certain HDL models for few problems pertaining to digital circuits and get scope for career development leading to lifelong learning.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS33 -DATA STRUCTURE AND APPLICATIONS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate and classify various data structures and their primitive operations	2	1										1	2			
CO2	Apply the concepts of arrays and strings in sorting and pattern matching applications	3	3	3	2	1							1	3		1	
CO3	Implement the operations of linear data structures like stacks, queues and linked lists.	3	3	2	2	2							1	3	1	1	
CO4	Demonstrate primitive operations on different types of trees and their applications	3	3	2	2	2							1	3	1	1	
CO5	Summarize the concepts of graphs, traversal techniques, hashing and file handling.	2	2	2	2	3							1	3	1	1	1
CO6	Design and develop solutions approaches to solve various computing problems by choosing appropriate data structures	3	3	3	3	3			1	1			2	2	3	3	1

	PO	Level	Justification
CO1	PO1	Moderately	The knowledge of mathematical principles and basics of computer science will help the students to classify various data structures and their primitive operations.
	PO2	Slightly	The knowledge of research and natural science does not contribute the stated CO;
	PO12	Slightly	Data Structures is part of any programming based applications.

CO2	PO1 PO2 PO3 PO4 PO5 PO12	Substantially Substantially Substantially Moderately Slightly Slightly	Knowledge of fundamental maths is essential for pattern matching ans sorting techniques. Sorting techniques needs analysis schemes which in turn needs maths background Pattern matching and sorting is an integral part of any complex engineering problemThe concepts of sorting and pattern matching moderately makes use of research methods. Primitive editing and debugging tools are used. Pattern matching and sorting is an integral part of any engineering problem
CO3	PO1 PO2 PO3 PO4 PO5 PO12	Substantially Substantially Moderately Moderately Moderately Slightly	Understanding of stacks, queues , linked lists is key to solution of many engineering problems Concepts of stacks, queues and linked lists are important Design solutions for complex programming applications contain basics of Stacks, queues and linked lists. Analysis, interpretation of data and design of experiments requires extensive knowledge of linked lists. Primitive editing and debugging tools are used. Any computer based applications require the concepts of stacks, queues and linked list
CO4	PO1 PO2 PO3 PO4 PO5 PO12	Substantially Substantially Moderately Moderately Moderately Slightly	The knowledge of mathematical principles helps in understanding the basic structure of trees. Primitive operations of trees such as insertion, deletion, traversals are very essential in solving engineeringproblems. Tree operations are integral part of any complex engineering problem Research oriented projects require the data to be represented in tree formatPractising project's solution makes use of modelling based on trees. Concept of trees is found to be used in diverse areas of engineering and technology.
CO5	PO1 PO2 PO3 PO4 PO5 PO12	Moderately Moderately Moderately Moderately Slightly Slightly	Mathematical knowledge helps in performing traversals on graphs and random accesson files . Basic Hashing operations are used in solving several engineering problems. Applications concerned with cultural, societal and environmental considerations makes use of file and hashingoperations. Effective searching techniques can be implemented using hashing and effective storage using files. Practising project's solution makes use of modelling based on graphs and hashingconcepts Graph based applications are relevant to broader category of applications
CO6	PO1 PO2 PO3 PO4 PO5 PO8 PO9 PO12	Substantially Substantially Substantially Substantially Substantially Slightly Slightly Moderately	Knowledge of mathematics and engineering fundamentals are extensively used in designing appropriate data structuresto solve engineering problems. Designing solution approach using proper data structures makes extensive use of maths and research literature. Choosing appropriate data structure is essential while designing health based andsafety projects Data structures is primary component in solving research based problems. Usage of modern IT tools helps in understanding the working of complex datastructures. Ethics in programming must be inculcated in engineering practice. Team work plays vital role while carrying out projects using heterogeneous data structures. Most of computer science based projects would need the extensive usage of various data structure.

	PSO	Level	Justification
CO1	PSO1	Moderately	Various data structures and their primitive operations are crucial in Computer Science based projects
CO2	PSO1 PSO3	Substantially Slightly	Sorting and pattern classification makes extensive usage of Maths The concepts of sorting and pattern matching are integral part of most of computer based projects and courses.
CO3	PSO1 PSO2 PSO3	Substantially Slightly Slightly	Understanding of stacks, queues , linked lists is key to solution of many engineering problems Concepts of stacks, queues and linked lists are vital in post graduate courses/projects
CO4	PSO1 PSO2 PSO3	Substantially Slightly Slightly	The knowledge of mathematical principles helps in understanding the basic structure of trees. Primitive operations of trees such as insertion, deletion, traversals are very essential in solving engineering problems. Tree operations are integral part of career of a computer science graduate .
CO5	PSO1 PSO2 PSO3 PSO4	Substantially Slightly Slightly Slightly	Mathematical knowledge helps in performing traversals on graphs and random access on files . Graph traversals and hashing needs the knowledge of different subjects like maths, graph theory and algorithmic techniques. Graph based applications are relevant to broader category of applications
CO6	PSO1 PSO2 PSO3 PSO4	Moderately Substantially Substantially Slightly	Knowledge of mathematics and engineering fundamentals are extensively used in designing appropriate data structures to solve engineering problems. Choosing appropriate data structure and designing IT systems needs the exposure to modern tool usage. . Data structures is the core stream of computer science and is widely used in most of the computer sciencebased projects Ethics and integrity in designing/programming must be inculcated in engineering practice.

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS34 -COMPUTER ORGANIZATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO 4
CO1	Visualize the basic building blocks of computer.	3											2	3		2	
CO2	Analyze the programs as sequence of machineinstructions.	3	2										2	2			
CO3	Explore different ways of communicating with I/O devices and interfaces.	3											2	2			
CO4	Design and evaluate the performance ofmemory systems.	3	2	3	1								1	3	2	1	
CO5	Demonstrate arithmetic and logical operations with integer and floating point operands.	3	3	3	2	1							1	3	2		
CO6	Analyze the basic functional units of processor.	3	2	3	1								1	3	2	2	

	PO	Level	Justification
CO1	PO1	substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and analyse its performance .
	PO12	moderately	Performance analysis helps the students to gain the research based knowledge and life-long learning.
CO2	PO1	substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and to generate the basic assembly language code.
CO3	PO1	substantially	The knowledge of basics of computer science will help the students to understand the communication between processor and I/O devices.

	PO12	moderately	Students are able to analyze the bus structure and its applications.
CO4	PO1 PO3	substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and to exploit cache performance and also enables students to design memory of different organizations.
	PO2	moderately	Performance of processor is analyzed theoretically using various cache coherence protocols and replacement algorithms.
	PO4 PO12	slightly	Students will learn how to improve the cache miss and cache miss penalty and to apply the same in life long learning.
CO5	PO1 PO2 PO3	substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and to increase the performance of processor using carry save adder, fast multiplication.
	PO4	moderately	Students are able to analyze the problems on Booth's algorithm by increasing the number of bits.
	PO5 PO12	slightly	Students are able to solve the problems using simulators.
CO6	PO1 PO3	substantially	The knowledge of basics of computer science will help the students to understand the working of processor and the generation of controlsignals..
	PO2	moderately	Students are able to analyse the microroutine.
	PO4 PO12	slightly	Students gain knowledge on microcontrollers.

CO	PSO	LEVEL	Justification
CO1	PSO1	substantially	Students will get solid foundation in the principles and practices of computer science, including mathematics, science and basicengineering.
	PS03	moderately	After gaining the knowledge in fundamentals, students will be prepared for their careers in the software industry or pursue higher studies and continue to develop their professional knowledge.
CO2	PSO1	moderately	Students are able to write assembly language programs
CO3	PSO1	moderately	Students are able to understand how I/O devices communicate within the system.
CO4	PSO1	substantially	Students are able to analyze the memory system.
	PSO2	moderately	Students are able to analyze flip flops, inverters and also virtual memory organization
	PSO3	slightly	After learning memory systems, students can continue to excel their career in hardware .
CO5	PSO1	substantially	The graduates will have solid foundation in the principles and practices of computer science, including mathematics, science and basic engineering.
	PSO2	moderately	Will get skills to work on arithmetic operations.
CO6	PSO1	substantially	The knowledge of basics of computer science will help the students to understand the working of processor and the generation of controlsignals..
	PSO2	moderately	Students are able to analyse the microroutine using microprogrammed control unit..
	PSO3	moderately	Analyze the working of microcontrollers.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS35 -UNIX & SHELL PROGRAMMING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Conceptualize the features of UNIX Architecture	1											1	1		1	
CO2	Interpret basic commands for file attribute manipulation.	2											1	1		1	
CO3	Demonstrate functioning of Vi editor and its commands	2				1							2	2		1	
CO4	Illustrate the usage of various UNIX filter commands.	2				1							2	2		1	
CO5	Design programs using shell scripts	1	1	3		1							2	1		2	
CO6	Analyze process life cycle development and demonstrate Perl programs.	1	1	3		2							1	1		2	

	PO	Level	Justification
CO1	PO1 PO12	maps slightly	Basic mathematical principles will help the students to understand the concepts of OS easily and to Understand and involve in life-long learning for knowledge enhancement.
CO2	PO1	Maps moderately	The knowledge of mathematical will help the students to understand the concepts easily and solve various problems.
	PO12	Maps slightly	Students identify, analyze and formulate solutions using existing C compiler and debugging tools .
CO3	PO1 PO12	Maps moderately	The knowledge of mathematics and basics of editors will help the students to understand the working of editors and there in involve in lifelong learning of designing of editors.
	PO5		The knowledge of editors for modeling of engineering activities with an understanding of the limitations
CO4	PO1 PO12	Maps moderately	Basics of mathematics principles and basics commands of unix will help the student to enhance knowledge about working of commands and there in involve himself in life long learning process.
	PO5	Maps slightly	Apply the knowledge of filters for prediction and modeling to engineering activities with an understanding of the limitations.
CO5	PO1 PO2 PO5	maps slightly	The knowledge of mathematical principles and basics of unix helps to analyze problems and to reach substantiated conclusions.
	PO3 PO12	Maps moderately	The knowledge of shell scripting will help to design solutions for engineering problems and that meet the specified needs and therein helps students to involve for lifelong learning activity.
CO6	PO1 PO2 PO12	maps slightly	The knowledge of mathematical principles and perl will help students to identify, analyze and formulate solutions using knowledge of perl programming and there involve in lifelong knowledge enhancement.
	PO3 PO5	Maps moderately.	The knowledge of perl programming will help to apply appropriate techniques, resources, for prediction and modeling to engineering activities with an understanding of the limitations.

	PSO	Level	Justification
CO1	PSO1 PSO3	Maps slightly	The knowledge of unix architecture will help students to have solid foundation about OS which will help in there career in software industry.
CO2	PSO1 PSO3	Maps slightly	Information about commands and its working will help the students to per sue career in the industry
CO3	PSO1	Maps Moderately	The working knowledge of various editors will give a basic idea that is required in the programming
	PSO3	Maps Slightly	Exposure to various editors will help in programming and debugging skills of students.
CO4	PSO1	Maps Moderately	Working of filters will provide idea about data extraction and filtering
	PSO3	Maps Slightly	Will help students to get motivated with handling data and develop a career in industry
CO5	PSO1	Maps Slightly	Shell exposure will provide the knowledge about unix OS and its interpretation of commands
	PSO3	Maps Moderately	Will provide complete knowledge about scripting to develop a career
CO6	PSO1	Maps Slightly	Process its life cycle will give knowledge about internal working of OS
	PSO3	Maps Moderately	Perl programming knowledge will help students to per sue is career in industry.

15CS36 –DISCRETE MATHEMATICAL STRUCTURES

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify the correctness of propositional logic and trutables.	2	1	1									1	1			
CO2	Make use of counting techniques, mathematical induction, permutations and combinations to solve problems.	2	1	1									1	1			
CO3	Analyze and develop partial orders, relations andfunctions.	2	1	1									1	1			
CO4	Analyze the use of principle of inclusion-exclusion,derangements and recurrence relations	2	1	1									1	1			
CO5	Analyze and develop types of graphs and trees.	2	1	1									1	1			

	POs	CRL	Justification
CO1	PO1	2	Along with the knowledge of mathematics, the concept of discrete mathematical structures is used for different applications of engineering.
	PO2	1	Discrete mathematical structures are used to identify, formulate and design a mathematical model for many engineering problems.
	PO3	1	The acquired mathematical knowledge is used for design of engineering problems.
	PO12	1	Knowledge of discrete structures is used for application of any chosen area in engineering disciplines for generating a mathematical model.
CO2	PO1	2	Study of logical connectives in discrete structure help in providing the solutions to engineering problems.

	PO2	1	By using with concept of logical connectives different problems are analyzed.
	PO3	1	The correctness of the analysis of the problem is better understood by the logical connectives.
	PO12	1	Knowledge of mathematics is used for application of any chosen area in engineering disciplines for generating a mathematical model.
CO3	PO1	2	The concept of relations and functions are applied to find solutions for some engineering problems.
	PO2	1	The theory of partial order is used to analyze the solutions pertaining to the problems.
	PO3	1	knowledge of Hasse diagram is used to design engineering problems.
	PO12	1	Knowledge of mathematical structures is used for application of any chosen area in engineering disciplines for generating a mathematical model.
CO4	PO1	2	Knowledge of discrete structures like rook polynomials is used in solving domain specific problems.
	PO2	1	Knowledge of discrete structures like recurrence relations is used analyze engineering problems.
	PO3	1	knowledge of derangements is used to design engineering problems.
	PO12	1	Knowledge of the principle of inclusion-exclusion is used for application of chosen area in engineering disciplines for generating a mathematical model.
CO5	PO1	2	The knowledge of group theory is used in various engineering problems.
	PO2	1	The theory of Error detection and error correction codes is used in analysis of engineering problems.
	PO3	1	The concept of group theory to design the solutions for engineering problems.
	PO12	1	Knowledge of trees is used for application of any chosen area in engineering disciplines for generating a mathematical model.
CO1	PSO1	1	The concept of Fundamentals of logic is applied for solving engineering problems.
CO2	PSO1	1	Analysis of problems using combinatorics is done by adapting software development methodology.
CO3	PSO1	1	Concept of relations and functions followed to solve an engineering problem.
CO4	PSO1	1	Specific counting techniques and recurrence relations are used to solve complex engineering problems.
CO5	PSO1	1	The method of Discrete structures such as Graph theory and combinatorics used to understand domain specific initiatives.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CSL37-ADE LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Utilize various electronic devices to design and construct the analog circuits	2	2	1	-	-	-	-	-	-	-	1	-	1	-	-	-
CO2	Use simulation package like multisim to design analog circuits.	-	-	1	-	3	-	-	-	1	-	1	-	1	2	-	-
CO3	Use various digital integrated circuits in the design and demonstration of various combinational logic and data processing circuits	2	1	3	-	-	-	-	-	-	-	1	1	3	-	1	-
CO4	Design and demonstrate various types of sequential circuits using flip flops.	2	-	3	-	-	-	-	-	-	-	1	1	2	-	1	-
CO5	Use simulation package like modelsim to design various digital circuits.	-	-	1	-	3	-	-	-	1	-	1	-	1	2	-	-
CO6	Understand the working and implementation of DAC and ALU	2	1	1	-	-	-	-	-	-	-	1	1	1	-	-	-

CO1	**PO**	**Level**	**Justification**
	PO1 PO2	Maps moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to implementfew analog circuits and analyze their functionality at a moderate level.
	PO3 PO11	Maps slightly	Student will be able to design few analog circuits and do projects in multidisciplinary environment to a slighter extent.
CO2	PO5	Maps substantially	Students will be able to use modern simulation tool like multisim to substantially analyze the working of analog circuits by simulation.
	PO3 PO9 PO11	Maps slightly	Student will be able to use simulation tools to design few analog circuits and do projects individually or in multidisciplinary environment to a slighter extent.
CO3	PO3	Maps substantially	Student will be able to substantially design and implement various combinational logic circuits using digital ICs.
	PO1	Maps moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to understandthe functioning of various combinational logic circuits at a moderate level.
	PO2 PO11 PO12	Maps slightly	Student will be able to apply first principles of mathematics and science to analyze the working of certaincombinational logic circuits and can manage to do projects using combinational logic in multidisciplinary environment to a slighter extent and get scope for career development leading to lifelong learning.
CO4	PO3	Maps substantially	Student will be able to substantially design and implement few sequential logic circuits using digital ICs.
	PO1	Maps moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to understandthe functioning of certain sequential logic circuits at a moderate level.
	PO11 PO12	Maps slightly	Student will be able to do projects using sequential logic in multidisciplinary environment to a slighter extent and get scope for career development leading to lifelong learning.
CO5	PO5	Maps substantially	Students will be able to use modern simulation tool like xilinx to substantially analyze the working of various digital circuits by simulation.
	PO3 PO9 PO11	Maps slightly	Student will be able to use simulation tools to design few digital circuits and do projects individually or in multidisciplinary environment to a slighter extent.
CO6	PO1	Maps moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to understandthe functioning of few D/A converters and ALU at a moderate level.
	PO2 PO3 PO11 PO12	Maps slightly	Student will be able to apply first principles of mathematics and science to analyze certain D/A converter and ALU and can manage to do projects using D/A converters in multidisciplinary environment to a slighter extent and get scope for career development leading to lifelong learning.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CSL38-DS LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Solve computational problems using basic C language constructs.	3	3	1	1	1				2			3	3	1	3	
CO2	Design and implement operations on both single and Multidimensional arrays.	3	2	3	1	1				1	2		3	3	1	2	
CO3	Develop menu driven programs to demonstrate primitive operations on stacks and queues	3	3	2	1	1				1	2		2	3	1	2	
CO4	Assess the operations on different types of Trees.	3	3	2		1				1	2		2	3	1	3	
CO5	Demonstrate traversal techniques on graphs	2	3	2	1	1				1	2		2	3	1	3	
CO6	Apply appropriate data structures to solve computing problems	3	2	3	2	2	2		1	2	1	2	3	3	1	2	1

CO1	**PO**	**Level**	**Justification**
	PO1 PO2 PO12	substantially	Knowledge of fundamental maths is essential for computational problems. Sorting techniques needs analysis schemes which in turn needs mathsbackground
	PO9	moderately	Team work plays vital role while carrying out projects using primitive and non primitive data types.
	PO3 PO4 PO5	slightly	Pattern matching and sorting is an integral part of any complex engineering problem The concepts of sorting and pattern matching moderately makes use of research methods. Primitive editing and debugging tools are used.
CO2	PO1 PO3 PO12	substantially	The knowledge of mathematical principles and basics of computer science will help the students to gain knowledge on arrays and its operations.
	PO2 PO10	moderately	Array concepts are very essential in solving engineering problems.
	PO4 PO5 PO9	slightly	Applications concerned with cultural, societal and environmental considerations makes use of array and its operation concept.
CO3	PO1 PO2	substantially	Understanding of stacks, queues , linked lists is key to solution of many engineering problems.Concepts of stacks, queues and linked lists are important in analyzing various problems.
	PO3 PO10 PO12	moderately	Design solutions for complex programming applications contain basics of Stacks, queues and linked lists.Any computer based applications require the concepts of stacks, queues and linked list
	PO4 PO5 PO9	slightly	Analysis, interpretation of data and design of experiments requires extensive knowledge of linked lists. Primitive editing and debugging tools are used. Team work plays vital role while carrying out projects
CO4	PO1 PO2	substantially	The knowledge of mathematical principles helps in understanding the basic structure of trees. Primitive operations of trees such as insertion, deletion, traversals are very essential in solving engineering problems.
	PO3 PO10 PO12	moderately	Tree operations are integral part of any complex engineering problem Concept of trees is found to be used in diverse areas of engineering and technology.
	PO5 PO9	slightly	Practising project's solution makes use of modelling based on trees. Team work plays vital role while carrying out projects
CO5	PO2	substantially	Basic Hashing operations are used in solving several engineering problems.
	PO1 PO3 PO10 PO12	moderately	Mathematical knowledge helps in performing traversals on graphs and random access on files . Applications concerned with cultural, societal and environmental considerations makes use of file and hashing operations. Graph based applications are relevant to broader category of applications
	PO4 PO5 PO9	slightly	Effective searching techniques can be implemented using hashing and effective storage using files. Practising project's solution makes use of modelling based on graphs and hashing concepts Team work plays vital role while carrying out projects
CO6	PO1 PO3 PO12	substantially	Knowledge of mathematics and engineering fundamentals are extensively used in designing appropriate data structures tosolve engineering problems. Choosing appropriate data structure is essential while designing health based and safety projects

			Most of computer science based projects would need the extensive usage of various data structure
	PO2 PO4 PO5 PO6 PO9 PO11	moderately	Designing solution approach using proper data structures makes extensive use of maths and research literature.Data structures is primary component in solving research based problems. Usage of modern IT tools helps in understanding the working of complex data structures. Team work plays vital role while carrying out projects using heterogeneous data structures Team work plays vital role while carrying out projects manage projects in multidisciplinary environments
	PO8 PO10	slightly	Ethics in programming must be inculcated in engineering practice. Documentation is maintained.

CO	**PSO**	**LEVEL**	**Justification**
CO1	PSO1 PSO3	substantially	Various data structures and their primitive operations are crucial in Computer Science based projects Pattern matching and sorting is an integral part of any complex engineering problem
	PS02	slightly	Sorting techniques needs analysis schemes which in turn needs maths background
CO2	PSO1	substantially	Sorting and pattern classification makes extensive usage of Maths
	PSO3	moderately	The concepts of sorting and pattern matching are integral part of most of computer based projects and courses.
	PSO2	slightly	
CO3	PSO1	substantially	Understanding of stacks, queues , linked lists is key to solution of many engineering problems
	PSO3	moderately	Concepts of stacks, queues and linked lists are vital in post graduate courses/projects
	PSO2	slightly	Concepts of stacks, queues and linked lists are important in analyzing various problems.
CO4	PSO1 PSO3	substantially	The knowledge of mathematical principles helps in understanding the basic structure of trees. Tree operations are integral part of career of a computer science graduate .
	PSO2	slightly	Primitive operations of trees such as insertion, deletion, traversals are very essential in solving engineering problems.
CO5	PSO1 PSO3	moderately	Mathematical knowledge helps in performing traversals on graphs and random access on files . Applications concerned with cultural, societal and environmental considerations makes use of file and hashing operations.
	PSO2	slightly	Graph traversals and hashing needs the knowledge of different subjects like maths, graph theory and algorithmictechniques. Graph based applications are relevant to broader category of applications
CO6	PSO1	substantially	Knowledge of mathematics and engineering fundamentals are extensively used in designing appropriate data structures to solve engineering problems.
	PSO3	moderately	Data structures is the core stream of computer science and is widely used in most of the computer science based projects
	PSO2 PSO4	slightly	Choosing appropriate data structure and designing IT systems needs the exposure to modern tool usage.Ethics and integrity in designing/programming must be inculcated in engineering practice.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15MAT41 ENGINEERING MATHEMATICS - IV

Co/po	P01	P02	P03	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	1		1		1	1		3
CO2	3	3	3	2	1		1		1	1		3
CO3	3	3	3	2	1		1		1	1	2	3
CO4	3	3	3	2	1		1		1	1	2	3
CO5	3	3	3	2	1		1		1	1	2	3

COs	POs	CRL	Justification
	PO1	3	Apply the knowledge Numerical methods to get solutions approximately for complex problems
	PO2	3	Apply the knowledge of Calculus in complex engineering problems

CO1	PO3	3	Moderately applied in development of solutions
	PO4	2	Used in research-based works
	PO5	1	Used to create programs to solve the complex problems
	PO7	1	understand the professional engineering solutions in environmental context
	PO9	1	the complex engineering problems allows students to effectively participate to work in teams
	PO10	1	used in writing reports effectively in a systematic manner
	PO12	3	To engage in independent in the broadest context in technological changes.
CO2	PO1	3	Apply the knowledge of Bessel's DE in Electrical engineering
	PO2	3	Apply the knowledge of Calculus in complex engineering problems
	PO3	3	Moderately applied in development of solutions
	PO4	2	Used in research based works
	PO5	1	Used to create programs to solve the complex problems
	PO7	1	understand the professional engineering solutions in environmental context
	PO9	1	the complex engineering problems allows students to effectively participate to work in teams
	PO10	1	used in writing reports effectively in a systematic manner
	PO12	3	To engage in independent in the broadest context in technological changes.
CO3	PO1	3	Apply the knowledge of poles, singularities in Fluid Mechanics
	PO2	3	Apply the knowledge of Calculus in complex engineering problems
	PO3	3	Seldom used in development of solutions
	PO4	2	complex analysis is extensively used in flow problems that arises in fluid mechanics
	PO5	1	Complex problems can solved by using moderns tool softwares
	PO7	1	study the professional engineering solutions in research area
	PO9	1	the complex engineering problems allows students to effectively participate to work in teams
	PO10	1	Strongly used in writing reports effectively in a systematic manner
	PO11	2	Partially applied
	PO12	3	Recognize and preparation and abillity in learning lifelong processes
	PO1	3	Apply the knowledge of probability theory in real life problems to predict the future
	PO2	3	helps students to analyse the problem effectively in engineering.

CO4	PO3	3	Seldom used in development of solutions
	PO4	2	used in real world problems
	PO5	1	Apply the recent techniques in complex engineering activities
	PO7	1	study the professional engineering solutions in research area
	PO9	1	the complex engineering problems allows students to effectively participate to work in teams
	PO10	1	Strongly used in writing reports effectively in a systematic manner
	PO11	2	Strongly applied
	PO12	3	Highly applied to engage in independent in the broadest context in technological changes.
CO5	PO1	3	Apply the knowledge of sampling theory for testing the hypothesis to accept or reject the givendata
	PO2	3	Apply the knowledge of sampling theory for testing the hypothesis to accept or reject the givendata
	PO3	3	Apply the knowledge of sampling theory for testing the hypothesis to accept or reject the givendata
	PO4	2	Students can apply statistical method to solve complex engineering problem and mathematicalmodelling
	PO5	1	Students can apply statistical method to solve complex engineering problem and mathematicalmodelling
	PO7	1	Students can apply statistical method to solve complex engineering problem and mathematicalmodelling
	PO9	1	the complex engineering problems allows students to effectively participate to work in teams
	PO10	1	Understand the concepts of mathematics and apply it to their work as a member or leader in ateam to manage the projects
	PO11	2	Understand the concepts of mathematics and apply it to their work as a member or leader in ateam to manage the projects
	PO12	3	The students will become aware of the need for life long learnibg and the continued upgrading oftechnical knowledge in application of numerical calculus

15CS42 - Software Engineering

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Assess professional and ethical responsibility, software engineering principles and activities involved inbuilding large software programs.	1					3		3	1	1		2	1	1	2	3
CO2	Demonstrate the process of requirements gathering, classification, specification andvalidation.	1			2	1	2		1	2	2		2	1	2	2	1
CO3	Design models for software system, component and process within realistic constraints.	2	1	3	3	2	1	1	1	2	1	1	2	1	3	2	1
CO4	Apply, design, implement, verify, validate and maintain software systems with metrics	2	2	3	3	1	1	1	1	1	1	1	2	2	2	3	1
CO5	Apply cost estimation and time schedulingfor quality project activities.	3	1	2	3	2	1	2	1	2	1	3	3	2	1	2	2
CO6	Recognize the need for agile software development.	2	1	3	3	2	1	1	2	2	1	1	2		1	3	1

	PO	Level	Justification
CO1	PO1 PO9 PO10	Maps Slightly	The knowledge of Software engineering fundamentals, will help the students to solve of complex engineering problems, function effectively as an individual, and as a member or leader in diverse teams and communicate effectively on complex engineering activities with the engineering community and with society at large.
	PO12	Maps Moderately	Understand the recent developments and life-long learning.

	PO6 PO8	Maps Strongly	Commit to professional ethics and responsibilities
CO2	PO1 PO5 PO8	Maps Slightly	The knowledge of basics of computer science, modern engineering and IT tools, ethical principles will help the students to apply the same and gather requirements
	PO4 P06 P09 PO10 P012	Maps Moderately	Analyze complex engineering problems, apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues in requirements gathering, classification, specification and validation, ability to engage in independent and life-long leaning in the broadest context of technological change and ethically function effectively as an individual, and as a member or leader in diverse teams.
CO3	PO2 PO6 PO7 P08 PO10 PO11	Maps Slightly	Ethically analyze, apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, communicate effectively on complex engineering activities in Design models for sustainable development of software system and Understand project management.
	PO1 PO5 PO9 POl2	Maps Moderately	Modem design tool usage for software system, component, mem within realistic constraints has been analyzed. Function effectively as an individual, and as a member or leader in diverse teams for system design Understand the recent developments and life-long learning.
	PO3 PO4	Maps Strongly	The knowledge of Software analysis and design helps in development of software solutions
CO4	PO2 PO6 PO8 PO10	Maps Slightly	Ethically analyze cost estimation and time scheduling for quality project activities. By applying engineering knowledge and Communicate effectively on complex engineering project activities
	PO3 PO5 PO7 PO9	Maps Moderately	Using modern tools in project scheduling, design solutions for complex engineering problems and function effectively as an individual: and as a member or leader in diverse teams in sustainable project development.
	PO1 PO4 PO11 PO12	Maps Strongly	The knowledge of basics of computer science, analyze, demonstrate knowledge and understanding of the engineering and management principles. Understand project management and finance.
CO5	PO5 PO6 PO7 PO8 PO9 PO10 PO11	Maps Slightly	Function effectively as an individual and as a member or leader in diverse teams, modem engineering and IT tools used for ethically Analyze, design: implement: verify, validate: maintain software systems with metrics with knowledge to assess societal: health: safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

	PO1 PO2 PO12	Maps Moderately	The knowledge of basics of computer science will help the students to analyze, design, implement, verify, validate, maintain software systems. Understand the recent developments and life-long learning.
	PO3 PO4	Maps Strongly	Analyze and design solutions for complex engineering problems
CO6	PO2 PO6 PO7 PO10 P011	Maps Slightly	Analyze complex engineering problems reaching substantiated conclusions with knowledge to assess societal, health, safety, legal and cultural issues in sustainable development. Communicate effectively on complex engineering activities and Project management.
	PO1 PO5 PO8 PO9 PO12	Maps Moderately	The knowledge of basics of computer science will help the students to ethically apply appropriate techniques for software development. Function effectively as an individual, and as a member or leader in diverse teams. Understand the recent developments and life-long learning.
	PO3 PO4	Maps Strongly	Conduct investigations and Design solutions for complex software engineering problems using agile software development.

	PSO	**Level**	**Justification**
CO1	PSO1 PSO2	Maps Slightly	The knowledge of basics of computer science will help the students to assess professional and ethical responsibility, software engineering principles and activities involved in building large software programs.
	PS03	Maps Moderately	The knowledge of software engineering principles and activities involved in building large software programs helps in student careers in the software industry or pursue higher studies and continue to develop their professional knowledge.
	PSO4	Maps Strongly	The knowledge of professional and ethical responsibility used to practice the profession with ethics, integrity, leadership and social responsibility.
CO2	PSO1 PSO4	Maps Slightly	The process of requirements gathering, classification, specification and validation knowledge helps in building solid foundation in the principles and practices of computer science, leadership and social responsibility.
	PSO2 PSO3	Maps Moderately	Requirements gathering skills used to communicate effectively using modem tools and prepare students for careers in the software industry
CO3	PSO1 PSO4	Maps Slightly	The knowledge of computer science used to understand design models for software system, component, process demonstrate leadership and social responsibility.
	PSO3	Maps Moderately	Design knowledge prepare students for their careers in the software industry or to pursue highs studies and continue to develop their professional knowledge

	PSO2	Maps Strongly	Software design skills helps student to function as member of multi-disciplinary teams
CO4	PSO1 PSO3 PSO4	Maps Moderately	The knowledge of basics of computer science will help the students to apply the same and exploit quality project activities, leadership and social responsibility. Prepare students for their careers in the software industry or pursue higher studies and continue to develop their professional knowledge.
	PSO2	Maps Slightly	Cost estimation and time scheduling for quality project activities Skills used to function as members of multi-disciplinary teams and to communicate effectively using modern tools.
CO5	PSO1 PS02	Maps Slightly	The knowledge of basics of computer science will help the students to Analyze, design, implement, verify, validate, maintain software systems. Understand to communicate effectively using modem tools.
	POS4	Maps Moderately	Students learn to practice the profession with ethics, integrity, leadership and social responsibility.
	PSO3	Maps Strongly	Students prepared for their careers in the software industry or pursue highs studies and continue to develop their professional knowledge.
CO6	PS02 PSO4	Maps Slightly	Agile software development Skills used to function as members of multi-disciplinary teams and to communicate effectively using modern tools. Students learn to practice the profession with ethics, integrity, leadership and social responsibility
	PS03	Maps Strongly	Agile development helps Student to prepare for their careers in the software industry or pursue highs studies and continue to develop their professional knowledge.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS43 -DESIGN & ANALYSIS OF ALGORITHM

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Restate various algorithmic approaches and various problem types	3	1	-	1	-	-	-	-	-	-	-	2	3	1	-	1
CO2	Formulate the analysis frameworks for algorithms	3	3	2	-	-	-	-	-	-	-	-	1	3	3	2	-
CO3	Design, Develop and Analyze the algorithms for problems on searching and sorting	3	3	3	2	1	-	-	-	1	-	-	1	3	3	3	2
CO4	Design and Develop algorithms to solve various problems based on graphs and trees	3	3	3	2	-	-	-	-	2	-	-	1	3	3	3	2
CO5	Compare different classes of problems such as P, NP, NP Complete and NP hard	1	2	2	3	-	-	-	-	2	-	-	1	1	2	2	3
CO6	Design, Develop and Analyze the algorithms for various computational problems	3	3	3	3	-	-	-	1	1	1	1	2	3	3	3	3

	PO	Level	Justification
CO1	PO1 PO2 PO4 PO12	Maps Moderately Maps Slightly Maps Slightly Maps Moderately	Fundamental algorithms are the key constituents in solving complex engineering problems Analysis of the algorithms are not covered; basic algorithms are taught. Introduction to various problem types are covered. The knowledge of various algorithmic approaches are essential for computer professionals for long time .
CO2	PO1 PO2 PO3 PO12	Substantially Substantially Maps Moderately Maps Slightly	Knowledge of math is very essential in devising analysis framework for algorithms Choosing an efficient formulation and analysis framework needs basic math Design of algorithms to solve complex problems moderately contributes in meeting the specific needs Formulating the analysis framework is the part of any computer based projects.
CO3	PO1 PO2 PO3 PO4 PO5 PO9 PO12	Substantially Substantially Substantially Maps Moderately Maps Slightly Maps Slightly Maps Slightly	Knowledge of math and science are essential in designing sorting/searching algorithms Choosing a particular sorting/searching algorithm for a specific task needs analysis and research Solution to complex engineering problems will have searching/sorting as their basic components in most cases To analyze and interpret the data sorting/searching contributes moderately. To implement and analyze the searching/sorting algorithms modern IT tools may be used. Multidisciplinary team would help in design and development of soring/searching algorithms. Sorting/Searching is primitive operation in any computer science based projects .
CO4	PO1 PO2 PO3 PO4 PO9 PO12	Substantially Substantially Maps Moderately Maps Moderately Maps Moderately Maps Slightly	Concepts of Graphs and tree heavily rely on theory of math. Graph traversals and shortest path algorithms contribute a lot in solving complex engineering problems. Spanning tree algorithms are employed in designing system components. Graph traversals, Huffman trees help in deriving valid conclusions. Writing efficient algorithm for graphs, trees needs notion from different streams of science and technology. With the emerging technological trends concept of graphs, trees have evolved and sustained.

CO5	PO1 PO2 PO3 PO4 PO9 PO12	Maps Slightly Maps Moderately Maps Moderately Substantially Maps Moderately Maps Slightly	Comparing different problem types needs knowledge of basic math To understand and analyze the problem types (clique, Hamiltonian cycle etc. knowledge of engineering science and math is essential Approximate solutions for combinatorial problems help to sollve complex engineering problems. Research based knowledge is essential to understand and interpret NP complete and NP hard problems.NP complete and NP hard problems have a broad scope of multidisciplinary problems. Since deterministic algorithms doesn't still exist for combinatorial problems, they slightly map the requirements.
CO6	PO1 PO2 PO3 PO4 PO8 PO9 PO10 PO11 PO12	Substantially Substantially Substantially Substantially Maps Slightly Maps Slightly Maps Slightly Maps Slightly Maps Moderately	Concepts of math and science are essential in solving computational problems. First principles of math and literature is needed to write efficient algorithms to solve complex problems Problems related to public health, environmental issues need efficient algorithms to be written Research based knowledge is crucial in designing and analyzing algorithms to solve computational problems. Professional ethics are need of the hour while designing algorithms to solve problems Designing algorithms needs input from multi -disciplinary streams Documenting the design and development of algorithms is essential while building projects Management and engineering principles are required in solving / writing algorithms Algorithmic skills are integral part of the career of an engineer

	PSO	**Level**	**Justification**
CO1	PSO1 PSO2 PSO4	Substantially Maps Slightly Maps Slightly	Various algorithmic approaches make use of principles of math, science and computer science and engineering. Modern tools might be used to design and develop algorithms. Writing efficient algorithms needs ethics and integrity.
CO2	PSO1 PSO2 PSO3	Substantially Substantially Maps Slightly	Principles of math and computer science is constantly used in formulating algorithms. Multidisciplinary teams and modern tools are very essential in designing and analyzing algorithms. The notion of formulation and analysis of algorithms help the graduates in their career and higher studies.

CO3	PSO1 PSO2 PSO3 PSO4	Substantially Substantially Substantially Maps Slightly	Writing algorithms to solve problems on searching and sorting needs knowledge of math and computer science To write and analyze sorting/searching algorithms modern tools may be used. Since sorting /searching operations are primitives in computer science stream, it is very relevant for the career. Writing an algorithm to solve real time problems needs ethics and integrity.
CO4	PSO1 PSO2 PSO3 PSO4	Substantially Substantially Substantially Maps Slightly	Graduate will have sound knowledge in graphs and trees with the help of fundamental math. Graphs and trees are multidisciplinary subjects and algorithms can be devised using modern tools. Most of the applications makes use of graphs and trees, and hence these concepts are needed throughout the career Ethics and integrity is needed in writing any algorithm
CO5	PSO1 PSO2 PSO3 PSO4	Maps Slightly Maps Moderately Maps Moderately Substantially	Combinatorial problems are hard to solve using deterministic algorithms. Modern tools may be used to obtain approximation algorithms/solution to NP complete problems. Since there are many challenges with respect to combinatorial problems, the graduate's higher studies career may be more challenging Ethics and integrity is needed in writing any algorithm
CO6	PSO1 PSO2 PSO3 PSO4	Substantially Substantially Substantially Substantially	Knowledge of math and computer science is extensively used in devising algorithms Notions from different subjects are essential in designing and analyzing an algorithm Designing algorithm is every day challenge to a computer professional/student Ethics and integrity in designing/programming must be inculcated in engineering practice.

RNS Institute of Technology

(VTU Affiliated, AICTE Approved, NAAC 'A' Grade Accredited)

UG Programs- CSE, ECE, ISE, EIE & EEE have been Accredited by NBA for the Academic year 2018-19, 2019-20, & 2020-21)

DR. VISHNUVARDHAN ROAD, CHANNASANDRA, RR NAGAR POST, BENGALURU – 560098

Department of Computer Science and Engineering

Vision: Preparing better Computer Professionals for a Real World

15CS44-MP & MC

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	**Illustrate 8086 Architecture and Addressing modes**	1	-	-	-	-	-	-	-	-	-	-	1	3	1	-	-
CO2	Develop x86 assembly language code to solve the problems	3	1	3	-	-	-	-	-	-	-	-	1	2	1	1	-
CO3	Demonstrate interrupt routines	2	-	2	-	-	-	-	-	-	-	-	2	2	1	-	-
CO4	Interface various I/O, memory devices to x86 processor.	2	2	-	1	-	-	-		1	-	-	2	2	1	-	-
CO5	Explore ARM fundamentals and instruction set.	2	-	2	-	2	-	-	-	1	-	2	2	2	1	-	-
CO6	Develop ARM programming skills.	2	1	2	-	2		-		1	-	2	2	2	1	1	1

CO1	**PO**	**Level**	**Justification**
	PO1	Maps slightly	Acquire knowledge of basic 8086 architecture and organization of Microprocessor.
	PO12	Maps slightly	Understand the Fundamentals of Microprocessors
CO2	PO1 PO3	Maps moderately	Acquire the knowledge of 8086 Instructions.
	PO2 PO12	Maps Strongly	Design solutions to problems using Instructions, macros, procedures using 8086 programming.
CO3	PO1 PO3 PO12	Maps moderately	Interrupt service routines are used demonstrated with practical considerations.
CO4	PO4 PO9	Maps slightly	Examine the input and output device considerations.
	PO1 PO2 PO12	Maps moderately	Develop Interface solutions for I/O devices efficiently and apply efficient techniques to communicate with X86 devices.
CO5	PO9	Maps slightly	Understand evolution and fundamentals of microcontrollers.
	PO1 PO3 PO5 PO11 PO12	Maps moderately	Acquire knowledge of basic Arm architecture and organization of microcontroller.
CO6	PO2 PO9	Maps slightly	Analyze and design programs to solve real-time problems
	PO1 PO3 PO5 PO11 PO12	Maps Strongly	Analyze the problem using efficient coding techniques through machine instructions and Design solutions to problems using macros, procedures using Arm programming

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS45-OBJECT ORIENTED CONCEPTS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Understand object oriented programming concepts using C++	2	-	-	-	-	-	-	-	-	-	-	2	3	-	3	-
CO2	Apply fundamental concepts of OOP in JAVA	3	-	1	-		-	-	-	-	-	-	2	3	-	3	-
CO3	Implement JAVA programs using Java JDK environment	2	2	3	-	3	-	-	-	1	-	-	2	3	3	3	-
CO4	Develop multi threaded and event handling programs	1	2	3	2	2	-	-	-	1	-	-	1	3	2	3	-
CO5	Explore usage of JAVA packages and Interfaces	1	-	1	2	3	-	-	-	1	-	-	1	3	2	3	-
CO6	Implement event driven GUI using Applets and Swings	3	2	3	2	3	-	-		1	-	-	1	3	2	2	-

CO1	**PO**	**Level**	**Justification**
	PO1 PO12	maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply performance parameters related to instruction level . Understand the recent developments and life-long learning.
CO2	PO1 PO3 PO12	Maps substantially Maps slightly Maps moderately	The knowledge of basics of computer science will help the students to apply the OOP concepts. Students can develop solutions using Java and C++ Ability to engage in independent and life-long learning in the broadest context of technological change.
CO3	PO1 PO2 PO3 PO5 PO9 PO12	Maps moderately Maps moderately Maps substantially Maps substantially Maps slightly Maps moderately	The knowledge of basics of computer science will help the students to apply the same and exploit Java IDE usage. Helps students to identify, formulate solutions using principles of mathematics and engineering sciencesthrough programming. Students design solutions for complex real world problems and design system components or processes that meet the specified needs with appropriate consideration Students create, select, and apply appropriate techniques, resources, and modern IT tools like EclipseIDE/NetBeans/Blue J etc. Students can do project as an individual/team Engage in independent and life-long learning in the broadest context of technological change.
CO4	PO1 PO2 PO3 PO4 PO5 PO9 PO12	Maps slightly Maps moderately Maps substantially Maps moderately Maps moderately Maps slightly Maps slightly	The knowledge of mathematical principles and basics of computer science will help the students identify basicsystem performance parameters related to thread level . Help students to explore and find solutions to problems related to thread creation and execution usingprinciples of mathematics. Design solutions for complex engineering problems and execute programs that meet the specified needswith appropriate consideration for the real world. Relative mapping from design level to implementation level Understanding execution of threads using modern tools like Eclipse. Using Eclipse environment modules of complex projects are developed and integrated. Muti-core Architectures require parallel processing via threads
CO5	PO1 PO3 PO4 PO5	Maps slightly Maps slightly Maps moderately Maps substantially	Programming specializations like interfaces and packages are understood in basic manner Application oriented programs use packages and interfaces Analysis of problem,Interpretation of data are done effectively using Eclipse IDE NetBeans,Eclipse IDE are used extensively in software development life cycle.

	PO9	Maps slightly	Effective functioning in Team work
	PO12	Maps slightly	Life long usage of packages and interfaces
CO6	PO1	Maps substantially	Understanding the fundamentals of event handling. Understanding event
	PO2	Maps moderately	handling mechanisms in extensive manner Developing GUI based
	PO3	maps substantially	applications.
	PO4	Maps moderately	Investigate problems related to event handling and multi threading.
	PO5	maps substantially	Eclipse IDE usage in understanding event handling.
	PO9	Maps slightly	Client Server applications require extensive usage of event handling mechanisms
	PO12	Maps slightly	Project front end development requires event handling

	PSO	**Level**	**Justification**
CO1	PSO1	Maps substantially	System level programs requires extensive knowledge of C++ language
	PSO3	Maps substantially	Software Industry requires fundamental C++programming knowledge
CO2	PSO1	Maps substantially	System level and Application level programs requires extensive knowledge of Java language
	PSO3	Maps substantially	Software Industry requires fundamental Java programming knowledge
CO3	PSO1	Maps substantially	Pillars of OOP are required in effective usage of Java Language.Modern tool usage
	PSO2	Maps substantially	like Eclipse
	PSO3	Maps substantially	Java Programming skill is basic requirement for Computer Professionals
CO4	PSO1	Maps substantially	Usage of threads to solve problems which are performance oriented in Real worldMulti
	PSO2	Maps moderately	threading and event handling used in interdisciplinary project development To develop
	PSO3	Maps substantially	GUI applications effectively using event handling
CO5	PSO1	Maps substantially	Exploring built in Java Packages and create own packages,interfaces for project developmentJava
	PSO2	Maps moderately	built in Packages and interfaces are used to develop multi disciplinary projects.
	PSO3	Maps substantially	Professional knowledge improved by knowing basic built in packages available in Java for program development
CO6	PSO1	Maps substantially	Project front end development requires extensive usage of event handling using Java SwingsModern tools
	PSO2	Maps moderately	like Eclipse/NetBeans used for program development.
	PSO3	Maps substantially	Helps students to develop career in software industry as front end developer

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS46-DATA COMMUNICATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify various types of computer networks and connecting devices.	2	2	1	1								2	3	1	2	
CO2	Evaluate the data transmission techniques.	3	3	3	2								3	3	1	2	
CO3	Illustrate TCP/IP protocol suite and switching criteria.	2	1	2	2								2	3	2	2	
CO4	Analyze different error checking methods used in Data Link layer.	3	3	2	3	1							1	3	2	3	
CO5	Demonstrate medium access control protocols, wireless and wired LAN architecture.	3	3	2	3								1	3	2	2	
CO6	Differentiate IP versions : IPV4, IPV6 and Mobile IP.	3	3	2	3	1							2	3	2	3	

	PO	Level	Justification
CO1	PO1 PO2 PO12	Maps moderately	The knowledge of mathematical principles and basics of computer science , networking will help the students to apply the same and identify various types of networks ,and understand the structure of network . Understand the recent developments in networking and life-long learning.
	PO3 PO4	Maps slightly	Students are able to understand bandwidth requirement, delay.
CO2	PO1 PO2	Maps Substantially	The knowledge on data transmission techniques helps students to understand the basics of networking, mathematical principles and exploretheir knowledge towards research.

	PO3 PO12		
	PO2	Maps Moderately	Analyse the effect of noise in data transmission.
CO3	PO1 PO3 PO4 PO12	Maps Moderately	The knowledge of networking,working of TCP/IP protocol suite , concept of routers and switches enables students to explore ideas towards research and projects
	PO2	Maps Slightly	Challenges of line coding can be analyzed.
CO4	PO1 PO2 PO4	Maps Substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and exploit errorchecking methods like CRC, Hamming Code
	PO3	Maps Moderately	Helps to design solutions for error checking methods
	PO5 PO12	Maps slightly	The problem with even and odd number of errors can be taken up as research.
CO5	PO1 PO2 PO4	maps Substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and identify different techniques used in avoiding collision during data transmission.
	PO3	Maps Moderately	Students learn Wireless architecture.
	PO5	Maps slightly	NS3 tool is used to simulate the network.
CO6	PO1 PO2 PO4	maps substantially	The knowledge of basics of computer science will help the students to perceive and enhance the IP address format and the interpretation ofeach field.
	PO12 PO3	Maps Moderately	Mobile IP helps to open up in research.
	PO5	Maps Slightly	NS3 tool is used to analyse nodes in the network

	PSO	Level	Justification
CO1	PSO1	Maps substantially	Students will have solid foundation in the principles and practices of computer science, including mathematics, science and basic engineering.
	PSO2	Maps Slightly	Ns3 tool is used to evaluate the performance of network
	PSO3	Maps Moderately	Students can excel in network platforms.
CO2	PSO1	Maps substantially	Students will have solid foundations in data transmission schemes
	PSO2	Maps Slightly	Having the knowledge on data transmission students can work in multiple discipline
	PSO3	Maps Moderately	Knowledge on transmission techniques are used in industry.
CO3	PSO1	Maps substantially	The graduates will have solid foundation in the principles of networking
	PSO2	Maps Moderately	Students can excel in network platforms.
	PSO3	Maps Moderately	The graduates of the Program will be prepared for their careers in the software industry or pursue higher studies
CO4	PSO1	Maps substantially	Students will have solid foundation in the principles including mathematics, science and basic engineering.
	PSO2	Maps Moderately	Students can excel in hardware of software fields.
	PSO3	Maps substantially	Its opens up the idea on research.
CO5	PSO1	Maps substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and exploit errorchecking methods like CRC, Hamming Code
	PSO2	Maps Moderately	Different methods are used for error checking codes.
	PSO3	Maps Moderately	Students are able to identify different techniques used in avoiding collision during data transmission.
CO6	PSO1	Maps substantially	Gives the fundamental knowledge in IP address
	PSO2	Maps Moderately	Using NS3 tool gives the knowledge on IP address, sub-net mask.
	PSO3	Maps substantially	Having a sound knowledge in IP versions student can show interest in higher studies and research.

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CSL47-DAA LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Develop solutions for computing problems using JAVA constructs.	3	2	2	1	1			1	2	2		3	3	1	3	
CO2	Design,implement and Symptotically analyze various algorithms on Sorting.	3	3	3	1	1				2	2		3	3	1	2	
CO3	Design and implement algorithms to solve problems on Graphs.	3	3	3	1	1				2	2		3	3	1	2	
CO4	Design and develop algorithms to solve combinatorial problems.	3	3	3	1	1				2	2		3	3	1	2	
CO5	Choose appropriate algorithmic techniques to solve computational problems.	3	2	3	2	1	1			3	1	1	3	2	1	2	
CO6	Analyze algorithms to deduce their time complexities.	3	3	1	1								2	2		2	

CO1	PO	Level	Justification
	PO1, PO12	maps substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the samein life long learning.
	PO5, PO2, PO3,	Maps moderately	Performance analysis helps the students to gain the research based knowledge and life-long learning.

	PO9 PO10		
	PO4, PO5,	Maps slightly	Enables students to analyze the complex problems and develop solutions using eclipse tool, and designer shouldknow their responsibilities and norms of engineering practise while developing the solutions.
	PO8		
CO2	PO1, PO2, PO3, PO12	Maps substantially	To asymptotically analyze the algorithms knowledge on mathematical principles is required, analyzing the various sorting solutions to choose the best and implementing it and apply the same in life long learning.
	PO9, PO10	Maps moderately	Documentation is made by analyzing the worst case, best case and average case effectively.
	PO4, PO5	Maps slightly	Tools used are eclipse for programming and microsoft excel to plot graph to analyze the performance.
CO3	PO1, PO2, PO3, PO12	Maps substantially	Students will gain knowledge on graphs, learn to choose the best routing algorithm and its working and to apply the same in life long learning.
	PO9, PO10	Maps moderately	Network problems are represented to graphs and effectively can find the solutions to complex routing problems.
	PO4, PO5	Maps slightly	Conduct investigation on complex problems.
CO4	PO1, PO2, PO3, PO12	Maps substantially	Students perceived knowledge on problems like travelling sales person problem and developed solutions for the same. Life long learning is involved to improve the time complexity.
	PO9, PO10	Maps moderately	Documentation is maintained.
	PO4, PO5	Maps slightly	Tools used are java eclipse.
CO5	PO1, PO3, PO9, PO12	Maps substantially	Gained knowledge on computational problems like sum of subsets, hamiltonian cycle. Developed solution for the same. Also documentation is maintained.
	PO2, PO4	Maps moderately	Analysis were made to decide which algorithmic technique should be used to solve problems.
	PO5, PO6, PO10, PO11	Maps slightly	Solution is developed using java eclipse and developed solution is useful to society.
CO6	PO1, PO2	maps substantially	After studying the various algorithmic approaches Enables to derive time complexities and can analyze the various solutions

	PO12	Maps moderately	Life long learning is involved to choose the algorithmic techniques inorder to improve the time complexity.
	PO3, PO4	Maps slightly	After analyzing the algorithms, students are able to develop the solution and can conduct further investigation for complex problems.

CO	PSO	LEVEL	Justification
CO1	PSO1, PSO3	Maps substantially	The graduates of the Program will have solid foundation in the principles and practices of computer science, including mathematics, science and basic engineering to solve simple computational problems. Through thisgraduates will be prepared for their careers in software industry.
	PS02	Maps slightly	Solution is developed using java eclipse and can be used in multi disciplinary teams.
CO2	PSO1	Maps substantially	Enables to gain knowledge on asymptotic notations.
	PSO3	Maps moderately	Once the algorithmic approaches are well versed, students can decide the approach to develop the solution which will be helpful for the careers in the software industry.
	PSO2	Maps slightly	Knowledge on asymptotic analysis will help the students to work in multi disciplinary teams.
CO3	PSO1	Maps substantially	Students will get solid foundation on graph based problems.
	PSO3	Maps moderately	Graph problems are related to network problems. Knowledge on this will help the students to work in network domains.
	PSO2	Maps slightly	All these solutions are developed in eclipse.
CO4	PSO1	Maps substantially	Combinatorial problems give strong foundation in mathematical principles and basics of computer science.
	PSO3	Maps moderately	Graduates will be prepared for the careers, gain professional knowledge.
	PSO2	Maps slightly	Combinatorial problems are developed using java eclipse.
CO5	PSO1, PSO3	Maps moderately	Knowledge on computational problems will give strong foundation on mathematical principles. And also higher studies can be made on this.
	PSO2	Maps slightly	Computational problems are developed using java eclipse.
CO6	PSO1, PSO3	Maps moderately	Analysis of algorithms means, analyzing the time complexity. To do this, strong mathematical background is required. Once analysis is done, solutions are developed which would be helpful to start careers in the softwareindustry.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CSL48- MICROPROCESSOR AND MICROCONTROLLER LABORATORY

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate x86 instruction set and addressing modes	2	1	-	-	-		-	-	-	-	-	1	2		1	2
CO2	Design and implement x86 assembly language programs.	2	-	-	2	2	-	-	-	-	-	-	1	3	1	2	2
CO3	Explore the functioning of hardware devices and its interfacing	2	--	2	-	2	-	-	-	-	-	-	2	2	1	2	2
CO4	Demonstrate ARM instruction set and addressing modes.	2	-	2	1	2	-	-	-	-	-	-	2	2	1	2	2
CO5	Implement ARM assembly and C language programs.	2	1	2		2	-	-	-	-	-	-	2	2	1	2	2
CO6	Implement interfacing of hardware devices to ARM family	2	-	-	-	-	-	-	-	-	-	-	1	2	2	2	2

	PO	Level	Justification
CO1	PO1	Maps moderately	Students will be able to apply the knowledge of engineering fundamentals to understand the 8086 instructions
	PO1 PO12	Maps slightly	Help students to recognize the need for 8086 Instructions and working.
CO2	PO1 PO4 PO5	Maps moderately	Students can apply the knowledge of engineering fundamentals to implement 8086 programs to solve the problems.
	PO12	Maps slightly	Acquires the working nature of Microprocessor 8086 Instructions.
CO3	PO1 PO3 PO5 PO12	Maps moderately	Develops various Interfaces to acquire the knowledge of Interfacing of 8086 Instructions with Hardware devices and interfacingboard.
CO4	PO2 PO3 PO5 PO12	Maps moderately	Graduate acquires the knowledge of ARM instruction set and Addressing Modes and Implementation of instruction are used indevelopment of Embedded system software.
	PO4	Maps slightly	Graduate acquires the knowledge of ARM instruction set and Addressing Modes.
CO5	PO2	Maps slightly	Execution of C programs in ARM environment is learned.
	PO2 PO3 PO5 PO12	Maps moderately	Interfacing of ARM Instructions and C programming Instructions are developed to interact with devices.
CO6	PO1	Maps moderately	Acquires the knowledge of development of Interfaces of Arm processors with Externals hardware devices and achievescommunication.
	PO12	Maps slightly	Graduates gains the Interfacing of hardware devices and Interfacing with ARM

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS51-MANAGEMENT ENTREPRENEURSHIP FOR IT INDUSTRY

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Comprehend Management activities	1		1	1		1	1		1		2	2	1	1	1	1
CO2	Emphasize Entrepreneur concepts and outline their importance inentrepreneurship	1	1	1	2		1	1	1	2		2	1	1	1	2	1
CO3	Apply Enterprise Resource Planning (ERP) solutions for ITindustry	3	3	3	3		1	3	1	2		1	1	3	2	3	1
CO4	Propose the methods for establishing micro, small and largescale enterprises	1	2	2	2		1	1	2	1		1	1	1		1	2
CO5	Apply IPRs and institutionalsupport for entrepreneurship	1	1	2	1		1	3	3	1	2	1	2	2		1	2
CO6	Prepare project report for IT industry based on feasibility studies	3	3	3	3		3	3	2	3	3	1	3	3		3	1

	PO	Level	Justification
CO1	PO11 PO12	maps moderately	The management principles and activities enable the students to develop overall personality to work as an individual, team member and further enhance his skills to become a leader.

	PO1 PO3 PO4 PO6 PO7 PO9	Maps slightly	The students will be able to understand concepts of managements activities which enhances behavior , personality and ethically.
CO2	PO4 PO9 PO11	Maps moderately	The Entrepreneur concepts will enable the students to work individually as a team member and helps to build leadership quality.
	PO1 PO2 PO3 PO6 PO7 PO8 PO12	Maps slightly	The Entrepreneur concepts outlined make the students to understand the basic ethical engineering principles to provide solutions to the problems faced by the people, which will motivate to become entrepreneur.
CO3	PO1 PO2 PO3 PO4 PO7	Maps Highly	The application of ERP will provide solution for complex engineering problems based on investigation done by research through strong science and engineering knowledge ,which is essential for sustainable development.
	PO9	Maps moderately	The gain knowledge can be applied and useful to multi disciplinary environment.
	PO6 PO8 PO11 PO12	Maps slightly	The ERP concepts described will enable the students to develop solutions, useful for the society in managing the projects in multidisciplinary environment.
CO4	PO1 PO3 PO4 PO8	Maps moderately	The proposed methods will enable the students to establish micro, small and large scale enterprises based on engineering principles can be useful to solve complex engineering problems and make them professionals with ethics.
	PO1 PO6 PO7 PO9 PO11 PO12	Maps slightly	By the proposed methods the students will be able to understand the basic engineering principles, to establish the enterprises on their own which are beneficial to the society .
CO5	PO7 PO8	Maps Highly	The IPRs will protect the creativity of the minds of the people, which can be utilized for providing an innovative engineering solutions to the society.
	PO3	maps moderately	The IPRs will protect the interest of the society at large
	PO1 PO2 PO4 PO6 PO9 PO11	Maps slightly	The Institutional support will enable the students to realize and implement the complex engineering problems which are beneficial to the individual and society as a whole.
	PO10 PO12		

CO6	PO1 PO2 PO3 PO4 PO6 PO7 PO9 PO10 PO12	Maps Highly	The generation of project reports based on strong engineering domain knowledge in a specific application to provide solutions to complex engineering problems designed which would enable them to take up the career as an industrialist based on feasibility studies.
	PO8	maps moderately	The contents of the project reports should be developed ethically.
	PO11	Maps slightly	The project report should be prepared taking into account of financial aspects.
	PSO	**Level**	**Justification**
CO1	PSO1 PSO2 PSO3 PSO4	Maps slightly	The management concepts studied will be the basis for the students to prepare their careers in software industry with ethics,integrity and leadership qualities through basic engineering concepts.
CO2	PSO3	maps moderately	The Entrepreneurial concepts and emphasis on their importance will motivate the students to take up the careerin softwareindustry and higher studies.
	PSO1 PSO2 PSO4	Maps slightly	The Entrepreneurial concepts will be helpful for the students to become an entrepreneur with ethics, integrity with social and moral responsibility in software industry through basic engineering principles.
CO3	PSO1 PSO3	Maps Highly	The solid foundations of principles and practices of Computer science and engineering will enable the students to provide effective solutions to solve the problems of IT industry by applying Enterprise Resource Planning (ERP) concepts.
	PSO2	Maps moderately	The knowledge gained by Enterprise Resource Planning (ERP) concepts will enable the students to communicate and developthe skills in multi disciplinary environment.
	PSO4	Maps slightly	The ERP concepts may encourage the students may take up this as a profession .
CO4	PSO4	Maps moderately	The proposed methods of micro, small and large scale enterprises will enable the students to set up these industries which enhances their leadership qualities with ethics and social responsibility.
	PSO1 PSO3	Maps slightly	The establishing of micro, small and large scale enterprises requires knowledge of basic engineering principles to take up as career in software industry.
CO5	PSO1 PSO4	Maps moderately	The knowledge of Computer science and engineering and IPR are essential to practice the profession with ethics, integrity, leadership and social responsibility. Apply IPRs and institutional support for entrepreneurship
	PSO3	maps slightly	The institutional support may facilitate the students to become an entrepreneur in IT industry
CO6	PSO1 PSO3	maps Highly	The knowledge of principles and practices of Computer science and engineering will enable the students to prepare the projectreport and become entrepreneur in IT industry after thorough feasibility studies. Prepare project report for IT industry based on feasibility studies
	PSO4	maps slightly	The preparation of project report for IT industry based on feasibility studies should be done with ethics, integrity and socialresponsibility

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS52-COMPUTER NETWORKS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate the principles of application layer protocols.	3	2	1			1	1					2	3	1	2	
CO2	Distinguish transport layer services and protocols.	3	3	2	2	3	1	1					2	3	1	2	
CO3	Classify IP and Routing Algorithms in network layer.	3	3	2	3	3	1	1					2	3	2	2	
CO4	Characterize the Wireless and Mobile Networks covering IEEE 802.11 Standard.	2	1		2	3	1	1					3	2	1	3	
CO5	Demonstrate streaming and working of Distribution servers.	1			1		1	1					1	1	1	2	
CO6	Exemplify Network support for multimedia.				1		1						1			1	

	PO	Level	Justification
CO1	PO1	Maps Strongly	The knowledge of strong basics of mathematical and engineering principles help students to demonstrate the principles of application layer protocols.
	PO2 PO12	Maps moderately	Analysis of application layer protocols help students to understand the existing system. Life long learning required to bring in thenew developments in the upcoming applications
	PO3 PO6 PO7	Maps slightly	Development of any new application layer protocol needs analysis and design procedures of new protocol and understanding the impacton societal and environmental contexts
CO2	PO1 PO2 PO5	Maps Strongly	The knowledge of strong basics of mathematical and engineering principles help students to demonstrate the applications and services of transport layer protocols. Analysis skills required are mandatory whenever deciding the relevant protocol that should be configured for any application. Tools like NS3 help students and to realize the working of protocols.

	PO3 PO4 PO12	Maps moderately	It helps students to come up with design strategies and arriving at solutions for the complex problems
	PO6 PO7	Maps slightly	Networking concepts are applied in various domains and hence it is relevant relate transport layer services to understand the impact of the professional engineering solutions in societal and environmental contexts
CO3	PO1 PO2 PO4 PO5	Maps Strongly	The knowledge of strong basics of mathematical and engineering principles help students to demonstrate the Network layer protocols. Analysis skills required are mandatory whenever deciding the relevant protocol that should be configured for any application and also for debugging complex problems. Tools like NS3 help students and to realize the working of protocols.
	PO3 PO12	Maps moderately	It helps students to come up with design strategies of any modifications required and induces life long learning
	PO6 PO7	Maps slightly	Networking concepts are applied in various domains and hence it is relevant to relate network layer services to understand the impact ofthe professional engineering solutions in societal and environmental contexts
CO4	PO5 PO12	Maps Strongly	Networking concepts are applied in various domains in day to day activities and hence induces life long learning. Tools like NS3 help students and to realize the working of protocols.
	PO1 PO4	Maps moderately	The knowledge of strong basics of mathematical and engineering principles help students to demonstrate the principles of application layer protocols. It enables student in Debugging solutions for complex problems.
	PO2 PO6 PO7	Maps slightly	wireless and mobile network concepts are widely used in various domains. Analysis skills will help students to understand its impactin societal and environmental contexts.
CO5	PO1 PO4 PO6 PO7 PO12	Maps slightly	The knowledge of basics of mathematical and engineering principles and debugging help students to demonstrate streaming and working of Distribution servers. Frequent upgrades of Distribution servers is inducing life long learning.
CO6	PO4 PO6 PO12	Maps slightly	Multimedia networking is multidisciplinary and regular updates in the domain leads to life long learning.

CO1	**PSO**	**Level**	**Justification**
	PSO1	Maps Strongly	The knowledge of strong basics of mathematical principles and computer architecture will help the students to apply and identify functionalities of different application layer protocols.
	PSO3	Maps moderately	Development of any new application in multidisciplinary environment requires longevity of learning
	PSO2	Maps slightly	Networking concepts are applied in various domains and hence students will gain skills to function as members of multi-disciplinary teams
CO2	PSO1	Maps Strongly	The knowledge of strong basics of mathematical principles and computer architecture will help the students to apply and identify functionalities of different transport layer protocols.
	PSO2	Maps moderately	Networking concepts are applied in various domains and hence students will gain skills to function as members of multi-disciplinary teams
	PSO3	Maps slightly	Transport layer services are required to establish communication and hence lifelong learning is necessary
CO3	PSO1	Maps Strongly	The knowledge of strong basics of mathematical principles and computer architecture will help the students to identify andapply functionalities of different network layer protocols.
	PSO2 PSO3	Maps moderately	Development of any new network layer protocol needs the understanding of its working in multidisciplinary environment and requires longevity of learning
CO4	PSO3	Maps Strongly	Networking concepts are applied in various domains in day to day activities and hence induces life long learning.
	PSO1	Maps moderately	The knowledge of strong basics of mathematical and engineering principles help students to demonstrate the principles of application layer protocols. It enables student in Debugging solutions for complex problems.
	PSO2	Maps slightly	Mobile networks are used in various domains and hence students will gain an . students will gain skills to function as members of multi-disciplinary teams
CO5	PSO3	Maps moderately	Frequent upgrades of Distribution servers induces life long learning.
	PSO 1 PSO 2	Maps slightly	The knowledge of mathematical principles and basics of computer science will help the students to understand the concepts of CDNs.
CO6	PSO3	Maps slightly	Multimedia networking is multidisciplinary and regular updates in the domain leads to life long learning.

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS53-DATABASE MANAGEMENT SYSTEM

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Represent database with different data modeling concepts.	2	-	2	-	-	-	-	-	1	-	-	1	3	1	1	-
CO2	Design simple database systems.	3	2	3	2	-	-	1	-	1	-	-	2	2	1	1	-
CO3	Use Structured Query Language (SQL) for building and manipulating database.	2	1	1	1	3	-	-	-	2	-	-	3	3	3	3	-
CO4	Develop application to interact with databases.	1	-	3	1	3	-	1	1	2	-	-	2	2	3	2	1
CO5	Analyze and apply normalization for better database design.	2	2	2	2	-	-	-	-	-	-	-	2	2	1	2	-
CO6	Demonstrate the use of concurrency control and transaction processing.	1	-	1	2	2	-	1	1	1	-	-	2	2	2	2	1

CO1	PO	Level	Justification
	PO1 PO3	Maps moderately	Fundamental knowledge of mathematics, science, engineering are used by students to represent database with different data modeling concepts and design solutions for complex engineering problems.
	PO9 PO12	Maps slightly	Students are able to function effectively as an individual and team and engage in independent and life-long learning.
CO2	PO2 PO4 PO12	Maps moderately	Students are able to Identify, formulate,analyze complex engineering problems by designing simple database design and conduct investigations. Engage in independent and life-long learning.
	PO7 PO9	Maps slightly	Design simple database systems by applying ethical principles and commit to professional ethics and responsibilities andFunction effectively as an individual and team.

	PO1 PO3	Maps Substantially	To design and develop database system student apply Fundamental knowledge of mathematics, science, engineering
CO3	PO1 PO9	Maps moderately	Students can Build and manipulate database using SQL by applying fundamental knowledge of engineering and work in team andas individuals
	PO5 PO12	Maps Substantially	Student use modern tools to build and manipulate database. Engage in independent and life-long learning.
	PO2 PO3 PO4	Maps slightly	Using SQL students can identify,formulate and design solutions for complex engineering problems.
CO4	PO1 PO4 PO7 PO8	Maps slightly	Students can design and develop database applications by applying fundamental knowledge of mathematics, science, engineering using modern tools for sustainable development. Ethics to be practiced in design and development.
	PO9 PO12	Maps moderately	Students can design and develop database applications individually or in team,it is a life long learning processin context oftechnological change.
	PO3 PO5	Maps Substantially	Design solutions for complex engineering problems using modern tools.
CO5	PO1 PO2 PO3 PO4 PO12	maps moderately	Analyze and apply normalization for better database design and development.by applying fundamentals of mathematics, science, and engineering in the context of changing technology.
CO6	PO1 PO3 PO7 PO8 PO9	Maps slightly	Demonstrate the use of concurrency control and transaction processing by applying fundamental knowledge for real worldproblems with transparency in societal and environmental contexts.
	PO4 PO5 PO12	Maps moderately	Using database tools to achieve concurrency,database consistency for real world problems.

	PSO	Level	Justification
CO1	PSO1	Maps moderately	Graduates of the Program will have solid foundation in Represent database with different data modeling concepts.
	PSO2 PSO3	Maps slightly	The graduates of the Program will have skills to function as member of database development team and to perform effectively in the software industry
CO2	PSO1	Maps moderately	The graduates of the Program will have solid foundation to design simple database systems.
	PSO2 PSO3	Maps slightly	The graduates of the Program will have skills to function as member of database development team and to perform effectively in the software industry
CO3	PSO1 PSO2 PSO3	Maps Substantially	The graduates of the Program will have solid foundation in the principles and practices of database development in the software industry and to communicate effectively using modern tools.
CO4	PSO1 PSO3	Maps moderately	The graduates of the Program will have solid foundation for design and development of database applications in the software industry
	PSO2	Maps Substantially	The graduates of the Program will have skills to function as members of multi-disciplinary teams and to communicate effectively using modern tools for development of database applications.
	PSO4	Maps slightly	The graduates of the program will practice the profession with ethics and integrity
CO5	PSO1 PSO3	Maps moderately	The graduates of the Program will have solid foundation to Analyze and apply normalization for better database design in the software industry
	PSO2	Maps slightly	The graduates of the Program will have skills to function as members of database development team byapply normalization for better database design using modern tools.
CO6	PSO1 PSO2 PSO3	Maps moderately	The graduates of the Program will have solid foundation to implement concurrency control and transaction processing in database development process.
	PSO4	Maps slightly	The graduates of the program will practice the profession with ethics to achieve transparency in database transactions.

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS54-AUTOMATA THEORY & COMPUTABILITY

		Program Outcomes												Program Specific Outcomes			
	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Acquire fundamental understanding of the core concepts in Automata theory and Theory of Computation	3	3	3	2								2	3	1		
CO2	Translate between different models of Computation	2	3	3	2								2	2	2		
CO3	Design Grammars and Automata for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.	2	2	2	2			1					1	2	2	2	
CO4	Apply rigorously formal mathematical methods to prove properties of languages, grammars and Automata	2	2	2	2			1					1	2	2	2	
CO5	Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness.	2	1	1	3								2			2	
CO6	Classify a problem with respect to different models of Computation	2	1	1	1								2			2	

CO1	**PO**	**Level**	**Justification**
	PO1 PO2 PO3	maps substantially	Knowledge of mathematics, engg fundamentals will help the student to identify ,formulate And analyze to develop engg. Problems.
	PO4 PO12	Maps moderately	Core concepts help students to design,analyze and interpret the data and to modelany real time problem.
CO2	PO1 PO4 PO12	Maps moderately	Apply of engg. Fundamentals helps students to synthesize model translation which helps for real time situation.
	PO2 PO3	Maps substantially	Identify, formulate and design solution for different models translation.
CO3	PO1 PO2 PO3 PO4	Maps moderately	Identify, formulate and design solution for research based problems using grammars and automata.
	PO7 PO12	Maps slightly	Mathematical model of automata and grammars are required for real-time solutions.
CO4	PO1 PO2 PO3 PO4	Maps moderately	Identify,formulate,design solution for research problems using properties of automataand grammars.
	PO7 PO12	Maps slightly	Mathematical model of automata and grammars are required for real-time solutions.
CO5	PO1 PO12	Maps moderately	Knowledge of mathematics and basics of computer will help the students to build reduced formal models.
	PO2 PO3	Maps slightly	Identify and design solution to reduce the formal models.
	PO4	Maps substantially	Complex problems are analyzed using formal models.
CO6	PO1 PO12	Maps moderately	Engg. Fundamentals help students for real-time problems.
	PO2 PO3 PO4	Maps slightly	Identify formulate design solutions for research based problems using different models of computation.

	PSO	Level	Justification
CO1	PSO1	maps substantially	Fundamental understanding of the core concepts in automata theory and Theory of Computation will give solidfoundation.
	PSO2	Maps slightly	Fundamental understanding of the core concepts in automata theory and Theory of Computation will give skills in multi-disciplinary teams and to communicate effectively using modern tools
CO2	PSO1 PSO2	Maps moderately	Translation between different models will give solid foundation and skills in multi-disciplinary teams.
CO3	PSO1 PSO2 PSO3	Maps moderately	Designing Grammars and Automata will give solid foundation ,skills in multi-disciplinaryteams and can pursue higher studies in theory of computation or formal modelling.
CO5	PSO3	Maps moderately	Developing skills in formal reasoning will help students to pursue higher studies in theory of computation orformal modelling.
CO6	PSO3	Maps moderately	Classifying a problem with respect to different models of Computation will give idea to pursue higher studies intheory of computation or formal modelling.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS553-ADVANCED JAVA AND J2EE

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Interpret enumerations and collections in advanced Java.	1				2							2	2		2	
CO2	Build programs using collection framework.	1	1	2		2							2	2	1	2	
CO3	Illustrate and develop String Handling methods in JAVA.	2	1	2		2							2	2		2	
CO4	Apply Servlets to develop web applications.	3	2	2	2	2				1		1	2	2	1	2	
CO5	Demonstrate database access using JDBC API.	3	2	2	1	2	1		1	1		1	2	2	1	2	1
CO6	Design reusable software components using JSP.	2	2	3	1	2	1			1		1	2	1	1	2	

CO1	**PO**	**Level**	**Justification**
	PO5 PO12	maps moderately	Modern engineering and IT tools will help students to understand collections framework and helps to engage in independent and life-long learning.
	PO1	Maps slightly	The basics of computer science will help students to understand and write programs with enumerations.
CO2	PO3 PO5 PO12	Maps moderately	Designing solutions for complex engineering problems with collection framework by using modern engineering and IT tools, also enable students to Recognize the need for, and have the preparation and ability to engage in independent and life-long learning.
	PO1 PO2	Maps slightly	Students can apply the knowledge of engineering fundamentals to analyze complex engineering problems using collection framework.
CO3	PO1 PO3 PO5 PO12	Maps moderately	The basics of computer science will help the students to illustrate strings by using modern engineering and IT tools and recognize the need of Strings in JAVA.
	PO2	Maps slightly	Identify, formulate and analyze complex engineering problems with different String handling methods.
CO4	PO1	Maps substantially	Help students to develop web applications with the knowledge of engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 PO3 PO4 PO5 PO12	Maps moderately	Students can Identify, formulate, and analyze complex engineering problems, servlets helps in designing the solutions. Several methods help in design of experiments using modern engineering and IT tools this also enable students to engage in independent and life-long learning.
	PO9 PO11	Maps slightly	Help students apply Servlets knowledge to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
CO5	PO1	Maps substantially	Help students to develop client server applications using JDBC API's with the knowledge of engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 PO3 PO5 PO12	maps moderately	Students can Identify, formulate, and analyze complex engineering problems, JDBC API's helps in designing the solutions and also help in design of experiments using modern engineering and IT tools this enable students to engage in independent and life- long learning.
	PO4 PO6 PO8 PO9 PO11	Maps slightly	Students shall Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice while developing complex client-server applications that Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
CO6	PO3	Maps substantially	Help students to develop client server applications using JSP with the knowledge of engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO1 PO2 PO5 PO12	maps moderately	Students can Identify, formulate, and analyze complex engineering problems, JSP's helps in designing the solutions and also help in design of experiments using modern engineering and IT tools this enable students to engage in independent and life-long learning.
	PO4 PO6 PO9 PO11	Maps slightly	Students shall Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice while developing complex client-server applications using JSP that Function effectively as an individual, and as member or leader in diverse teams, and in multidisciplinary settings.

CO1	**PSO**	**Level**	**Justification**
	PSO1 PSO3	maps moderately	The graduates of the Program will have solid foundation in the principles and practices of computer science, including basic engineering.Advanced Java helps The graduates to prepared for their careers in the software industry or pursue higher studies and continue to develop their professional knowledge.
CO2	PSO1 PSO3	Maps moderately	The graduates of the Program will have solid foundation in the principles and practices of computer science, including basic engineering.Collections framework helps The graduates to prepared for their careers in the software industry or pursue higher studies and continue to develop their professional knowledge.
	PSO2	Maps slightly	Knowledge of Collections framework function as members of multidisciplinary teams and to communicate effectively using modern tools.
CO3	PSO1 PSO3	Maps slightly	The graduates of the Program will have solid foundation in engineering.Strings knowledge helps The graduates to preparedfor their careers in the software industry.
CO4	PSO1 PSO3	Maps moderately	The graduates of the Program will have solid foundation in the principles and practices of computer science, including basic engineering.Concept of Servlets helps The graduates to prepared for their careers in the software industry or pursue higher studies and continue to develop their professional knowledge.
	PSO2	Maps slightly	Servlets help students to function as members of multidisciplinary teams and to communicate effectively using modern tools.
CO5	PSO1 PSO3	maps moderately	The graduates of the Program will have solid foundation in the principles and practices of computer science, including basic engineering.Concept of JDBC helps The graduates to prepared for their careers in the software industry or pursue higher studies and continue to develop their professional knowledge.
	PSO2 PSO4	Maps slightly	The graduates of the Program will have skills to function as members of multidisciplinary teams and to communicate effectively using modern tools. The graduates of the program will practice the profession with ethics, integrity, leadership and social responsibility.
	PO3	Maps substantially	Knowledge of JDBC will help students to prepare for their careers in the software industry..
CO6	PSO3	maps moderately	The concepts of JSP help students to develop their professional knowledge.
	PSO1 PSO2	Maps slightly	Help students to have solid foundation computer science, also enable them to function as members of multidisciplinaryteams and to communicate effectively using modern tools.

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS562-ARTIFICIAL INTELLIGENCE

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify the AI based problems	3	1	1	1									2	2	1	
CO2	Determine the technique to solve theAI problems	2	2	2	2									2	2	2	
CO3	Investigate various learning techniques	2	2	2	2									1		1	
CO4	Analyze expert systems	2	2		1	1								1	2	2	1
CO5	Explore different stages in NaturalLanguage processing	2	1		1									2	2	2	
CO6	Implement appropriate learning algorithms	2	2	2	1	1								2		2	

CO1	PO	Level	Justification
	PO1	maps Strongly	The knowledge of mathematical fundamentals and basics of computer science will help the students to apply the sameinidentification of the AI problems
	PO2 PO3 PO4	Maps Slightly	The knowledge of problem identification, design and investigation will help the students slightly in basic AIbasedproblem solving
CO2	PO1 PO2 PO3 PO4	Maps Moderately	The engineering knowledge, problem analysis, design and conducting investigation is moderately required indetermining the technique to solve the given AI problem

CO3	PO1 PO2 PO3 PO4	Maps Moderately	The engineering knowledge, problem analysis, design and conducting investigation is moderately required indetermining the selection of design technique
CO4	PO1 PO2	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to analyse theconceptsof expert system
	PO4 PO5	Maps slightly	Expert system requires moderate knowledge about investigation and modern tool usage
CO5	PO1	maps Moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same inNLP
	PO2 PO4	Maps slightly	The identification of problem and conduction of investigation is needed slightly for the NLP
CO6	PO1 PO2 PO3	Maps moderately	Moderate Engineering Knowledge, problem analysis and Design of solution for learning algorithms
	PO4 PO5	Maps slightly	Research method and modern tools may be slightly used in learning algorithms

CO1	**PSO**	**Level**	**Justification**
	PSO1 PSO2	maps Moderately	Solid foundation in principles and help the graduates to work with multi disciplinary teams moderately
	PSO3	Maps Slightly	Slightly help the graduate can prefer to work in the software industry or higher study
CO2	PSO1 PSO2 PSO3	Maps Moderately	Different problem techniques in AI help the graduates in their profession, higher studies and multi disciplinary teamworkingenvironment
CO3	PSO1 PSO3	Maps Slightly	Learning techniques slightly help the graduates in their principles and practices along with higher studies
CO4	PSO2 PSO3	Maps moderately	Expert system is the newly growing area. The graduates will work in the team as well as prefer to pursue in higherstudies
	PSO1 PSO4	Maps slightly	Expert system help the graduates in slightly in their basic engineering knowledge as well as leadership
CO5	PSO1 PSO2 PSO3	maps Moderately	Knowledge of NLP will help the graduate moderately in their engineering practices, multi-disciplinary teams, higherstudies
CO6	PSO1 PSO3	Maps moderately	Moderate knowledge of learning algorithms moderately helping the graduates in foundation of engineering knowledge as well as higher studies

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COMPUTER NETWORKING LAB (15CSL57)

10CS72	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate error detection technique using CRC	2	3	1	2						2	1	2	2	1	1	
CO2	Analyze and compare different routing protocols	2	2	1	2						2	1	2	2	1	1	
CO3	Implement connection-oriented and connection-less protocols in the network	2	2	1							2	1	2	2	1	1	
CO4	Demonstrate security features in networks using RSA algorithm	2	2	1	2				1		2	1	2	2	1	1	1
CO5	Analyze techniques to avoid congestion in the network	2	2	1	2						2	1	2	1	1	1	1
CO6	Implement, analyze and evaluate networking protocols using NS3 Tool	2	1			2					1		1	1	1		

	PO	Level	Justification
CO1	PO2	Maps Substantial(High)	The students can able to understanding algorithm, code implementation and demonstration
	PO3 PO11	Maps Slight(Low)	Design and development on real network will be complex process
	PO1 PO4 P10 P12	Maps Moderate (Medium)	Complex problems in networking , analysis and interpretation in research methods

CO2	PO1 PO2 PO4 PO10 P12	Maps moderately	Student required knowledge and presentation skills for designing solution for routing problems in computer networking
	PO3 PO11	Slight (Low)	Student may required strong knowledge on designing solution for complex routing problems in computer networking andperformance analysis which enables them research in routing protocols and social benefits
CO3	PO1 PO2 PO10 PO12	Moderate(Medium)	Student required knowledge on connection-oriented and connection-less protocols and presentation skills for designing solutionfor wired and wireless communication in computer networking
	P3 P11	Slight (Low)	Student may required strong knowledge on complex connection-oriented and connection-less protocols in computer networking and performance analysis which enables them research in wired and wireless communication and social benefits
CO4	PO3 PO8 PO11	Slight (Low)	Designing and implementing security algorithms in computer network security will be complex process to improve safetymeasures for social benefits. Adopting ethical principles in multidisciplinary environments is tough task
	PO1 PO2 PO4 PO10 PO12	Moderate(Medium)	The students required strong mathematical and computer science and engineering knowledge to solve complex problems related to attacks in communication networks. The student will have more opportunities for professional career and research for life-long learning in context of technological change
CO5	PO1 PO2 PO4 PO10 Po12	Maps moderately	The students required strong mathematical and computer science and engineering knowledge to solve complex problems related to analyze and avoidance of congestion in communication networks. The student will have more opportunities for professional career and research for life-long learning in context of technological change
	PO3 PO11	Maps slightly	Basis for students to design and implementation of avoidance of congestion in computer network for improving QoS for social benefits.
CO6	PO1 PO5	maps moderately	The students are able to analyze and evaluate networking protocols through simulator using NS3 Tool
	PO2 PO10 PO12	Maps slightly	The students are analyze the different networking protocols through simulator using NS3 Tool

	PSO	Level	Justification
CO1	PSO2 PSO3	Maps slightly	The students with programming skills can able implement programs for error detection in less scalable networks and they will have opportunities to work in software industry
	PSO1	Maps moderately	The students are able to Demonstrate error detection technique using CRC with fundamental knowledge of computer networks
CO2	PSO2 PSO3	Maps slightly	The students are able to Analyze and compare routing protocol in simple networks and pursue higher studies
	PSO1	Maps moderately	The students with foundation knowledge of computer networking and mathematics able to Analyze and compare different routing protocols
CO3	PSO2 PSO3	Maps slightly	The students are able to analyse connection-oriented and connection-less protocols in the network using modern tools
	PSO1	Maps moderately	The students with foundation knowledge of computer networking and mathematics able to Implement the connection-oriented and connection-less protocols in the network
CO4	PSO2 PSO3 PSO4	Maps slightly	The students with programming skills can able implement programs for security simple network attacks
	PSO1	Maps moderately	The students with foundation knowledge of computer networking and mathematics able to demonstrate security features in networks using security algorithm
CO5	PSO1 PSO2 PSO3 PSO4	Maps slightly	The students with computer networking skills can able implement programs for Analyze congestion avoidance in the network
CO6	PSO1 PSO2	Maps slightly	The students with computer programming and networking skills can able to analyze networking protocols using NS3 Tool

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CSL58-DBMS WITH MINI PROJECT LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate DDL commands on Database.	1	-	1	-	-	-	-	-	-	-	-	-	1	-	1	
CO2	Create ER diagrams and conceptualschema for the problems given.	2	1	2	1	-	-	-	-	-	-	1	-	2	2	2	
CO3	Apply Integrity constraints on relations.	2	2	2	1	-	-	-	-	-	-	1	-	2	2	2	
CO4	Demonstrate Update operations.	1	-	1	-	-	-	-	-		-	-	1	1	-	1	
CO5	Demonstrate more complex SQLqueries.	1	1	1	-	-	-	-	-	-	-	-	1	2	1	2	
CO6	Implement, analyze and evaluatethe project developed application..	-	2	2	1	-	1	1	-	1	-	2	-	1	-	1	

CO1	PO	Level	Justification
	PO1 PO3	Maps slightly	Fundamental knowledge of engineering are used by students to demonstrate DDL commands to design database.
CO2	PO2 PO4 PO11	Maps slightly	Students are able to identify entities and attributes to create ER diagrams and conceptual schema for the problems given in syllabus.
	PO1 PO3	Maps moderately	Students are able to create ER diagrams and conceptual schema for the problems given by applying Fundamental knowledge of engineering.

CO3	PO1 PO2 PO3	Maps moderately	Students can apply Integrity constraints on relations using Fundamental knowledge for Problem analysis and design
	PO4 PO11	Maps slightly	Students can **Conduct investigations for** analysis and interpretation of data and indicate these in report.
CO4	PO1 PO3 PO12	Maps slightly	Students can Demonstrate Update operations using fundamental knowledge for development of database in the context of technological change.
CO5	PO1 PO2 PO3 PO12	maps slightly	Demonstrate more complex SQL queries using Fundamental knowledge of engineering and mathematics for problem analysis and development of database in the context of technological change.
CO6	PO2 PO3 PO11	Maps moderately	Students can implement, analyze and evaluate the project developed for an application using first principlesof mathematics, sciences, and engineering.
	PO4 PO6 PO7 PO9	Maps slightly	Projects can address areas like societal, health, safety, legal and cultural issues as individual or team.

CO1	**PSO**	**Level**	**Justification**
	PSO1 PSO3	Maps slightly	Graduates of the Program will have solid foundation in Demonstration of DDL commands
CO2	PSO1 PSO2 PSO3	Maps moderately	The graduates of the Program will have solid foundation in creation of ER diagrams and conceptual schema
CO3	PSO1 PSO2 PSO3	Maps moderately	The graduates of the Program will have solid foundation in applying Integrity constraints on relations andare prepared for their careers in the software industry
CO4	PSO1 PSO3	Maps slightly	The graduates of the Program will have solid foundation for Demonstration of update operations and continue to develop their knowledge. .
CO5	PSO1 PSO3	Maps moderately	The graduates of the Program will have solid foundation to Analyze and apply normalization for better database design in the software industry
	PSO2	Maps slightly	The graduates of the Program will have skills to Demonstrate more complex queries using modern tools.
CO6	PSO1 PSO3	Maps slightly	Graduates of the Program will have solid foundation to Implement, analyze and evaluate the projectdeveloped for an application..

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS61-CNSCL

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Apply the basics of number theory invarious cryptographic techniques and summarize its applications	3	3		1								2	3	2	2	
CO2	Design and develop simple cryptography algorithms for real world situation.	3	3	3	2	2	2		1				2	3	2	2	1
CO3	Analyze various authentication andkey agreement protocols.	1	2	1	2	1	1		1				2	2	2	2	1
CO4	Realize the security threats caused bymalware, design Firewall based solutions and access control techniques to solve societal security problems.	1	3	3	2	2	2		1				2	2	2	2	1
CO5	Investigate the need of security at different levels/layers and its services.	1	2	2	1	1	1		1				2	1	2	2	1
CO6	Understand cyber security and illustrate the need of cyber Law.	1	2		1		3		2				3		1	2	2

CO	PO	Level	Justification
CO1	PO1 PO2	Substantially	Strong Basics of mathematics and computer science will help the students to Identify, formulate and apply number theory in various cryptographic techniques and summarize its applications
	PO4	Slightly	analysis and interpretation of data helps student to identify cryptographic techniques
	PO12	Moderately	Various cryptographic techniques helps student to prepare for their professional career.
CO2	PO1 PO2 PO3	Substantially	Apply the knowledge of mathematics and basics of computer science to identify and formulate Design and develop simplecryptography algorithms for real world situation
	PO4 PO5 PO6	Moderately	Design, analysis and interpretation of data by applying appropriate techniques for designing solution to various authenticationtechniques
	PO8	Slightly	develop various cryptographic methods to apply norms of engineering practices.
CO3	PO1 PO3 PO5 PO6 PO8	Slightly	Basics of mathematics and computer science will help the students to identify , design and analyze various authentication and keyagreement protocols using modern tools to apply professional ethics.
	PO2 PO4 PO12	Moderately	Identify, formulate and design process to analyze various authentication and key agreement protocols which help the students toengage in life long learning in the context of technological change.
CO4	PO1 PO8	Slightly	Apply the knowledge of computer science to analyze security threats caused by malware, design Firewall based solutions and access control techniques to solve societal security problems by practicing engineering norms
	PO2 PO3	Substantially	Identify, formulate, Design Firewall based solutions
	PO4 PO5 PO6	Moderately	design and analysis Firewall based solutions and access control techniques using modern tools to apply reasoning informed bythe contextual knowledge to legal issues.
CO5	PO1 PO4 PO5 PO6 PO8	Slightly	Basics of computer science helps to Investigate the need of security at different levels/layers and its services using appropriate techniques to asses legal issues by applying engineering norms.
	PO2 PO3 PO12	Moderately	Identify, formulate, the need of security at different levels/layers and Recognize the need for, life long learning process.
CO6	PO1 PO4	Slightly	Apply the knowledge of engineering fundamentals to investigate the need for cyber security and illustrate the need of cyber Law
	PO2 PO8	Moderately	Identify and formulate the need for cyber security and cyber Law helps students to understand and commit to professional ethics
	PO6	Substantially	Apply reasoning informed by the contextual knowledge to assess cultural issues and the consequent responsibilities relevant to the professional engineering practice in the field of Computer science.

CO1	**PSO**	**Level**	**Justification**
	1	Substantially	Solid foundation in the principles of computer science including mathematics is required to Apply the basics ofnumber theory in various Cryptographic techniques
	2 3	Moderately	With the knowledge of various cryptographic techniques students will have skills to function as members ofmultidisciplinary teams and to communicate effectively using modern tools and can be prepared for their careers.
CO2	1	Substantially	Solid foundation in maths and computer science is required to develop cryptographic algorithms.
	2 3	Moderately	Design and develop simple cryptography algorithms for real world situation using modern tools and can be preparedfor their careers in IT industry
	4	Slightly	Cryptographic techniques help students to practice profession with ethics.
CO3	1 2 3	Moderately	Basics of computer science help the students to analyze various authentication and key agreement protocols usingmodern tools. These knowledge can help them in their careers or higher studies.
	4	Slightly	Authentication protocols and key agreement protocols help the students to practice their profession with ethics.
CO4	1 2 3	Moderately	With the Basics of computer science, students can realize the security threats caused by malware, design Firewallbased solutions and access control techniques to solve societal security problems, which can be communicated effectively using modern tools and also help the students to build their careers.
	4	slightly	Students can practice their profession with ethics.
CO5	1 4	slightly	Basics of computer science help the students to Investigate the need of security at different levels/layers and its services. And help the students to understand the social responsibility.
	2 3	moderately	Security at different layers help the undergraduates to communicate effectively as members of multidisplinary teams.
CO6	2	Slightly	Graduates can understand cyber security and illustrate the need of cyber Law to function as a multidisplinary teams.
	3 4	Moderately	Understand cyber security and cyber Law help the graduates to develop their professional careers with ethics.

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS62-COMPUTER GRAPHICS & VISUALIZATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Design and implement algorithms for 2D graphics primitives and attributes.	2	1	2	1	2							1	2	2	2	
CO2	Illustrate geometric transformations on both 2D and 3D objects.	2	2	2	1	3				1			2	2	2	2	
CO3	Apply concepts of clipping and visible surface detection in 2D and 3D viewing, and illumination models.	2	3	3	2	3							2	2	2	2	
CO4	Decide suitable hardware and software for developing graphics applications using OpenGL.		1	1	1	3			1	1			1		2	3	
CO5	Explore different representation of Programming event driven input.			2	1	2				1			2	1		3	
CO6	Demonstrate and analyze the concepts of curve surfaces.	2	3	2	3	2				1			2	2		2	

	PO	Level	Justification
CO1	PO1 PO3 PO5	Maps moderately	Representation of primitives and attributes requires engineering knowledge and design. Programs can be designed using OpenGL package.
	PO2 PO4 PO12	Maps slightly	2D graphics requires the knowledge of problem analysis,
CO2	PO1 PO2 PO3 PO12	Maps moderately	Geometric transformation has mathematical calculations

	PO4 PO9	Maps slightly	Simple applications can be designed
	PO5	Maps Substantially	2D and 3D representation requires openGL package
CO3	PO1 PO4 PO12	Maps moderately	Initial geometrical concepts are required
	PO2 PO3 PO5	Maps Substantially	Different algorithms of clipping are analyzed
CO4	PO2 PO3 PO4 PO8 PO9 PO12	Maps slightly	Knowledge of software and hardware are used for development
	PO5	Maps moderately	Related packages for development
CO5	PO3 PO5 PO12	maps moderately	Different event level programming requires appropriate call back function
	PO4 PO9	Maps slightly	Different call back can be used for an application
CO6	PO9	Maps slightly	Can be used for developing simple projects
	PO1 PO3 PO5 PO12	maps moderately	Basic knowledge and representation of lines and points
	PO2PO4	Maps Substantially	Requires understanding of formulas

CO1	**PSO**	**Level**	**Justification**
	PSO1 PSO2 PSO3	Maps moderately	Knowledge of Graphics is required
CO2	PSO1 PSO2 PSO3	Maps moderately	Geometric transformation requires the understanding of
CO3	PSO1 PSO2 PSO3	Maps moderately	Various Clipping and visible detection are applied
CO4	PSO2	Maps moderately	Hardware and software configuration
	PSO3	Maps substantially	
CO5	PSO1	Maps slightly	event driven program will help for further programming in other areas of computer science
	PSO3	Maps substantially	Software industry requires the usage of callback function
CO6	PSO1 PSO3	Maps moderately	Mathematical representation will help to improve the basic knowledge of computer science and can be used for developing and designing other applications.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS63 - SYSTEM SOFTWARE AND COMPILER DESIGN

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Interpret the concepts of assemblers and macroprocessors	2	-	-	-	-	-	-	-	-	-	-	1	1	-	1	-
CO2	Illustrate the functions, features and design options of loader	1	-	-	-	2	-	-	-	-	-	-	1	1	-	1	-
CO3	Classify the phases of compiler and build lexical analyzers	3	2	2	1	2	-	-	-	-	-	-	1	2	1	1	-
CO4	Design parsers for compilers	3	1	1	1	2	-	-	-	-	-	-	2	2	2	1	-
CO5	Construct SyntaxDirected Translation and generate intermediatecode	2	1	-	1	2	-	-	-	-	-	-	1	2	-	1	-
CO6	Generate ASM code fora given intermediate code	3	1	1	1	-	-	-	-	-	-	-	2	1	-	2	-

	PO	Level	Justification
CO1	PO12	Maps slightly	The students will be to apply the knowledge of assembler design in his life time.
	PO1	Maps moderately	The knowledge of engineering fundamentals will help the students to apply the same in the design of assembler
CO2	PO1 PO12	Maps slightly	The knowledge of engineering fundamentals will help the students to apply the same in the design of loader
	PO5	Maps moderately	The tool-Loader is required to load the program
CO3	PO4 PO12	Maps slightly	The investigation of the given Lex problem is needed slightly.
	PO2 PO3PO5	Maps moderately	The Lex knowledge may slightly help the students in their problem analysis. Design and development of solutions aswell as the tools available for the Lexers are moderately needed.
	PO1	Maps substaintially	The Lex knowledge may slightly help the students in their problem analysis as well as their higher studies
CO4	PO2 PO3PO4	Maps slightly	Good Engineering knowledge, identification of the problem, designing the solutions, preferring the modern toolusage is strongly recommended for the parsing technique
	PO5 PO12	Maps moderately	The student need to conduct an moderate investigation while designing various parsing technique
	PO1	Maps substaintially	Various parsing techniques may help the students slightly in their multidisciplinary environment as well as theirhigher studies
CO5	PO2 PO4 PO12	Maps slightly	Importance of Translation is known here.
	PO1PO5	Maps moderately	It helps the students in understanding the requirement of Intermediate code
CO6	PO2PO3 PO4	Maps slightly	To implement the code generator the student should have a strong fundamental knowledge, problem analysis anddevelopment of solutions
	PO12	Maps moderately	The code generator needs an moderate investigation of complex problems
	PO1	Maps substaintially	Code generators require a slight knowledge of modern tools, may help slightly in their working with amultidisciplinary team as well as in their preparation for long term learning

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS64-OPERATING SYSTEMS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify the functionalities of OS and their categories	3	-	1	-	-	-	-	-	-	-	-	2	3	-	1	-
CO2	Evaluate multithread techniques and process scheduling algorithms	2	3	3	2	-	1	1	-	-	-	-	3	2	3	2	-
CO3	Demonstrate suitable techniques for resource management	3	3	3	2	-	1	1	-	-	-	-	2	3	3	1	-
CO4	Evaluate file system allocation and memory management techniques	3	3	3	2	-	1	1	-	-	-	-	2	3	2	2	-
CO5	Review the protection mechanisms in processing environment	-	-	-	-	-	1	-	1	-	-	-	1	1	2	1	1
CO6	Explore the case studies on Operating Systems	-	1	-	-	-	-	-	-	-	2	-	1	-	-	1	1

	PO	Level	Justification
CO1	PO1	Maps Strongly	The knowledge of strong basics of mathematical principles and computer architecture will help the students to applyand identify functionalities of different categories of operating System.
	PO12	Maps moderately	Operating System functionality should be adapted with the new changing environment and requires life long learning.
	PO3	Maps slightly	Development of any new application requires fundamental knowledge of functionalities of OS
CO2	PO2 PO3 PO12	Maps Strongly	Designing Parallel Processing Techniques requires strong analysis skills and longevity of learning.
	PO1 PO4	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply and exploit parallel processing and analyse the processor performance

	PO6 PO7	Maps slightly	Apply multithreading techniques and Scheduling Algorithms to develop applications to solve societal, environmental health, safety, legal and cultural issues for sustainable development.
CO3	PO1 PO2 PO3	Maps Strongly	The knowledge of mathematical principles and basics of computer science will help the students to build concurrencyin application.
	PO4 PO12	Maps moderately	Dead lock management needs analysis and research methodologies to solve complex issues of real world and requires lifelong learning.
	PO6 PO7	Maps slightly	Dead lock Management Skills should be adapted with the new changing environment for sustainability.
CO4	PO1 PO2 PO3	Maps Strongly	The knowledge of mathematical principles and basics of computer science will help the students to design and buildvarious resource management techniques.
	PO4 PO12	Maps moderately	Determine the best memory management technique for different operating systems needs analysis of complex problem solving skills and requires lifelong learning.
	PO6 PO7	Maps slightly	Resource Management Skills should be adapted with the new changing environment for sustainability.
CO5	PO6, PO8 PO12	Maps slightly	Design of Protection mechanisms in processing environment involves Ethical principles for various fields.
CO6	PO10	Maps moderately	Linux operating System can be realized in multidisciplinary environments.
	PO2 PO12	Maps slightly	Upgrading of operating System features requires analysis of existing modules and lifelong learning.

CO1	**PSO**	**Level**	**Justification**
	PSO1	Maps Strongly	The knowledge of strong basics of mathematical principles and computer architecture will help the students to apply and identify functionalities of different categories of operating System.
	PSO3	Maps slightly	Development of any new application in multidisciplinary environment requires fundamental knowledge of functionalities of OS
CO2	PSO2	Maps Strongly	Designing Parallel Processing Techniques requires strong analysis skills to adapt in multidisciplinary environment.
	PSO1 PSO3	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply and exploit parallel processing and analyse the processor performance and longevity of learning.
CO3	PSO1 PSO2	Maps Strongly	The knowledge of mathematical principles and basics of computer science will help the students to build concurrency in different application platforms.
	PSO3	Maps slightly	Dead lock Management Skills should be adapted with the new changing environment for sustainability.
CO4	PSO1	Maps Strongly	The knowledge of mathematical principles and basics of computer science will help the students to design and build various resource management techniques.
	PSO2 PSO3	Maps moderately	Determine the best memory management technique for different operating systems needs analysis of complex problem solving skills and requires lifelong learning.
CO5	PSO2	Maps moderately	Design of Protection mechanisms in processing environment involves Ethical principles for various fields.
	PSO1 PSO3 PSO4	Maps slightly	The knowledge of mathematical principles and basics of computer science will help the students to design Protection mechanisms in processing environment involving Ethical principles
CO6	PSO3 PSO4	Maps slightly	Upgrading of operating System features with Ethical Principles requires analysis of existing modules and lifelong learning.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS651-DATA MINING AND DATAWAREHOUSING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO 4
CO1	Identify data mining problems and implement thedata warehouse	-	-	-	-	-	-	-	-	-	-	-	2	2	2	-	-
CO2	Define multi-dimensional data models	2	2	-	-	3	-	-	-	-	-	-	2	-	2	2	-
CO3	Categorize types of data and preprocessingtechniques.	1	1	-	1	-	-	-	-	-	-	-	2	1	-	-	-
CO4	Evaluate Association algorithms and itsapplications.	1	2	1	2	1	2	-	-	-	-	-	2	1	2	2	-
CO5	Apply various Classification techniques anddifferent types of classifiers	-	2	1	-	3	2	-	-	2	1	-	2	-	2	2	-
CO6	Analyze and adapt existing clustering techniquesin various applications.	-	2	1	2	3	2	-	-	2	1	-	2	-	-	-	-

	PO	Level	Justification
CO1	PO12	maps moderately	The basic knowledge of computer science will help the students to understand Data Mining Applications and need the Data Warehouse and its applications
CO2	PO1 PO2 PO12	Maps moderately	The knowledge of Data Models helps students to identify real world requirements and represent data in multiple dimensions and support for effective data visualization.
	PO5	Maps Strongly	The knowledge of Data Modeling helps to understand different multidimensional views like rotate, slicie-horizontal/vertical
CO3	PO1 PO2	Maps Slightly	The understanding of Data Preprocessing operations helps students to analyze different types of data available in the real world
	PO12	Maps Moderately	The knowledge of data preprocessing techniques help students to build the efficient data mining models
CO4	PO2 PO4 PO6 PO12	Maps moderately	The knowledge of Association Rule mining helps students to analysis market basket data and find useful associations such that it enhances the decision-making in business organizations
	PO1 PO3 PO5	Maps slightly	Explore different Association Rule mining evaluation techniques and applications such that it used to compare and develop efficient models.
CO5	PO2 PO6 PO7 PO12		It helps to understand different application of classifier algorithms
	PO5	Maps strongly	The evaluation of classification models using outcomes of Confusion Matrix
	PO3 PO10	Maps slightly	Helps to understand domain specific applications of classifier models like disease classification, document classification etc.
CO6	PO2 PO4 PO6 PO9 PO12	Maps Moderately	The basics of Data Clustering helps to analyze real world data and identification of domain specific clusters
	PO3 PO10	Maps Slightly	The understanding of clustering algorithms helps to students to understand the patterns exhibited by real world data
	PO5	Maps Strongly	Analyze various cluster models and gain the knowledge different similarity and dissimilarity measures

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS653-OPERATIONS RESEARCH

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Understand how to translate a real-world problem, into a mathematical formulation	3	3	1										3	2		
CO2	Identify and apply optimization techniques forvarious problems	2	2	2	2									2	2	2	
CO3	Model the given problem as transportationproblem and solve.	2	2	2										2	2		
CO4	Apply game theory for decision support system	2	2	2	1									2	2	2	
CO5	Analyze and apply branch-and-bound and heuristic methods to solve general integerproblems	2	2	2	2									2	2	2	
CO6	Incorporate the principles of assignment of jobsand find the optimal solution	2	2	2										2	2		

CO1	**PO**	**Level**	**Justification**
	PO1 PO2	maps Highly	The knowledge of mathematical principles and basics of computer science will help the students to apply the same in translating the real world problems to mathematical models
	PO3	Maps slightly	The knowledge of translating the real world problems into mathematical models will help the students to design and develop some solutions for the society and that will help them in lifelong learning by using some simulation tools
CO2	PO1 PO2 PO3 PO4	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same in understanding the concepts optimization techniques for various problems
CO3	PO1 PO2 PO3	Maps Moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same in transportation problems solving
CO4	PO1 PO2 PO3	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same in game theory for decision support system
	PO4	Maps slightly	Transportation problems solving may be exploited by using some simulation tools and the student can use this technique for solving the real world problems. This will help them for life long learning
CO5	PO1 PO2 PO3 PO4	maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same in heuristic methods
CO6	PO1 PO2 PO3	maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same in assignment problems solving

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS664-PYTHON APPLICATION PROGRAMMING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Examine python syntax and semantics and be fluent in using flow control and functions	1	2			3							1	2	2	3	
CO2	Demonstrate proficiency in handling strings and file systems in python	1	2	2	2	3							1	1	3	2	
CO3	Create and run python programs using core data structures like lists, dictionaries , tuples, and sets and use of Res	2	2	3	2	3							2	1	3	2	
CO4	Interpret and apply the concepts of OOP	2	1	3	-	3						3	2	1	3	2	
CO5	Implement exemplary applications related to network programming and web services	2	2	3	2	3						3	2	1	3	2	
CO6	Implement database applications in python	2	2	3	2	3						3	2	1	3	2	

	PO	Level	Justification
CO1	PO5	Maps Substantially	Python is used in most of the applications
	PO2	Maps Moderately	Python is used as a tool to solve modern day problems.
	PO1 PO12	maps Slightly	Python can be used for other courses and applications.
CO2	PO5	Maps Substantially	String manipulation functions of python are used in most modern day front end tools.
	PO2 PO3 PO4	Maps Moderately	File manipulation functions are used in developing solutions.
	PO1 PO12	maps Slightly	File and string handling functions are used in other applications.
CO3	PO3 PO5	Maps Substantially	Tuples, list and dictionary are used in NO SQL DB
	PO1 PO2 PO4 PO12	Maps Moderately	In order to design the DS properly, analysis of requirement and problem solving technique is required.
CO4	PO3 PO5 PO11	Maps Substantially	Object oriented concepts can be applied for most of the applications.
	PO1 PO12	Maps Moderately	OOPS is used in other domains also.
	PO2	maps Slightly	OOPS can render solutions for engineering problems.
CO5	PO3 PO5 PO11	Maps Substantially	Networking aspects are used in most of the modern front end tools.
	PO1 PO2 PO4 PO12	Maps Moderately	Socket programming requires engineering knowledge and is used in other domains.
CO6	PO3 PO5 PO11	Maps Substantially	SQLITE is a DBMS package which can be used in modern applications.
	PO1 PO2 PO4 PO12	Maps Moderately	DDL and DML statements of SQLITE are used of solving real time problems.

CO1	**PSO**	**Level**	**Justification**
	PSO1 PSO2	Maps Moderately	Python is used in most of the applications
	PSO3	Maps Slightly	Python is used as a tool to solve modern day problems.
CO2	PSO1	maps Slightly	String manipulation functions of python are used in most modern day front end tools.
	PSO2	Maps Substantially	File manipulation functions are used in developing solutions.
	PSO3	Maps Moderately	File and string handling functions are used in other applications.
CO3	PSO1	maps Slightly	Tuples, list and dictionary are used in NO SQL DB
	PSO2	Maps Substantially	In order to design the DS properly, analysis of requirement and problem solving technique is required.
	PSO3	Maps Moderately	Data structure is the theme of modern day software.
CO4	PSO1	maps Slightly	Object oriented concepts can be applied for most of the applications.
	PSO2	Maps Substantially	OOPS is used in other domains also.
	PSO3	Maps Moderately	OOPS can render solutions for engineering problems.
CO5	PSO1	maps Slightly	Networking aspects are used in most of the modern front end tools.
	PSO2	Maps Substantially	Socket programming requires engineering knowledge and is used in other domains.
	PSO3	Maps Moderately	Networking concepts are used in other domains also.
CO6	PSO1	maps Slightly	SQLITE is a DBMS package which can be used in modern applications.
	PSO2	Maps Substantially	DDL and DML statements of SQLITE are used of solving real time problems.
	PSO3	Maps Moderately	DBMS concepts are used in other disciplines.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CSL67-SS & OS LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Implement and demonstrateLexer's and Parser's.	3	1	3	2	3	-	-	-	-	-	-	1	-	-	1	-
CO2	Design and implement variousparsing techniques.	3	3	3	2	3	-	-	-	-	-	1	1	2	1	2	-
CO3	Design and implement a codegenerator	3	3	3	2	1	-	-	-	-	-	1	1	3	1	3	-
CO4	Evaluate different process scheduling algorithms in operatingSystem.	3	2	3	2	1	-	-	-	-	-	-	1	2	1	1	-
CO5	Design and implement a solution for deadlocks in operating system	3	2	3	2	1	-	-	-	-	-	-	1	1	1	1	-
CO6	Evaluate different algorithms required for management of page allocation techniques	3	2	3	2	1	-	-	-	-	-	-	1	1	1	2	-

CO1	**PO**	**Level**	**Justification**
	PO1 PO3 PO5	Maps Strongly	The knowledge of mathematical principles and basics, design and development of solutions as well as the tools available for the Lexers are strongly needed
	PO4	Maps moderately	The investigation of the given Lex problem is needed moderately
	PO2 PO12	Maps slightly	The Lex knowledge may slightly help the students in their problem analysis as well as their higher studies
CO2	PO1 PO2 PO3 PO5	Maps Strongly	Good Engineering knowledge, identification of the problem, designing the solutions, preferring the modern tool usage is strongly recommended for the parsing technique
	PO4	Maps moderately	The student need to conduct an moderate investigation while designing various parsing technique
	PO11 PO12	Maps slightly	Various parsing techniques may help the students slightly in their multidisciplinary environment as well as their higher studies
CO3	PO1 PO2 PO3	Maps Strongly	To implement the code generator the student should have a strong fundamental knowledge, problem analysis and development of solutions
	PO4	Maps moderately	The code generator needs an moderate investigation of complex problems
	PO5 PO11 PO12	Maps slightly	Code generators require a slight knowledge of modern tools, may help slightly in their working with a multidisciplinary team as well as in their preparation for long term learning
CO4	PO1 PO3	Maps Strongly	The knowledge of mathematical principles and basics of computer science will help the students to apply and exploit parallel processing and analyse the processor performance.
	PO2 PO4	Maps moderately	Designing Parallel Processing Techniques requires strong analysis skills and longevity of learning.
	PO5 PO12	Maps slightly	Development and performance analysis of various Process Scheduling algorithms requires longevity of learning.
CO5	PO1, PO3	Maps Strongly	The knowledge of mathematical principles and basics of computer science will help the students to build concurrency in application.
	PO2 PO4	Maps moderately	Dead lock management needs analysis and research methodologies to solve complex issues of real world.
	PO5 PO12	Maps slightly	Dead lock Management Skills should be adapted with the new changing environment and requires lifelong learning.
CO6	PO1, PO3	Maps Strongly	The knowledge of mathematical principles and basics of computer science will help the students to design and build various resource management techniques.
	PO2 PO4	Maps moderately	Determine the best memory management technique for different operating systems needs analysis of complex problem solving skills.
	PO5 PO12	Maps slightly	Resource Management Skills should be adapted with the new changing environment and requires lifelong learning.

CO1	**PSO**	**Level**	**Justification**
	PSO3	Maps slightly	The Lex knowledge may slightly help the students in their problem analysis as well as their higher studies
CO2	PSO1 PSO3	Maps moderately	Good Engineering knowledge, identification of the problem, designing the solutions, preferring the modern tool usage is strongly recommended for the parsing technique as well as their higher studies
	PSO2	Maps slightly	Various parsing techniques may help the students slightly in their multidisciplinary environment
CO3	PSO1 PSO3	Maps Strongly	To implement the code generator the student should have a strong fundamental knowledge, problem analysis and development of solutions
	PS02	Maps moderately	Code generators require a slight knowledge of modern tools, may help slightly in their working with a multidisciplinary team as well as in their preparation for long term learning
CO4	PSO1	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply and exploit parallel processing and analyse the processor performance and longevity of learning.
	PSO2 PSO3	Maps slightly	Development of any new application in multidisciplinary environment requires fundamental knowledge of functionalities of OS
CO5	PSO1 PSO2 PSO3	Maps slightly	The knowledge of mathematical principles and basics of computer science will help the students to build concurrency in different application platforms and should be adapted with the new changing environment for sustainability.
CO6	PSO1 PSO2	Maps slightly	The knowledge of mathematical principles and basics of computer science will help the students to design and build various resource management techniques.
	PSO3	Maps moderately	Determine the best memory management technique for different operating systems needs analysis of complex problem solving skills and requires lifelong learning.

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CSL68-CG WITH MINI PROJECTLAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Apply the concepts of computer graphics.	2	1	2	-	2	-	-	-	-	-	-	2	2	1	1	-
CO2	Implement computer graphics applications using OpenGL.	2	2	3	2	2	-	-	-	-	-	-	2	2	2	1	-
CO3	Animate real world scenarios using OpenGL	2	2	3	2	2	1	1	-	3	3	2	2	2	2	2	-
CO4	Rasterize 2D primitives using OpenGL	2	3	2	1	2	-	-	-	-	-	-	2	2	2	1	-
CO5	Implement different clippingalgorithms.	2	2	2	1	2	-	-	-	-	-	-	2	3	2	1	-
CO6	Transform 2D and 3D geometricobjects.	3	3	2	1	2	-	-	-	2	-	-	2	2	2	1	

CO1	PO	Level	Justification
	PO1 PO3 PO5 PO12	Maps moderately	The knowledge of mathematics will help to draw graphics primitives (line, rectangle, circle etc). and write simple graphicsprograms. Basic knowledge can be used for life long learning
	PO2	Maps slightly	Basic mathematical equations (eg equation of line,circle,ellipse) are required to understands graphics.
CO2	PO3	Maps Substantially	The knowledge of Opengl will help students to design and develop programs using builtin primitives.
	PO1 PO2 PO4 PO5 PO12	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to independently write opengl programs.
CO3	PO6 PO7	Maps Slightly	Students will be able to code for pictorial representation of environmental canditions.
	PO1 PO2 PO4 PO5 PO11 PO12	Maps moderately	Students will be able to create 2D and 3D objects.
	PO3 P09 P10	Maps Substantially	Students can develop mini-projects using opengl concepts and write the report for their project and also present their projects, which will help them to improve communication skills.
CO4	PO4	Maps slightly	The knowledge of mathematical principles and basics of computer graphics will help students to investigate on different drawing methodology.
	PO1 PO3 PO5 PO12	Maps moderately	Using modern tools and framework (Visual Studio) students will be able draw 2D objects.
	PO2	Maps Substantially	Using different algorithms students will be able to analyse how pixels are plotted to draw objects on display window.
CO5	PO1 PO2 PO3 PO5 PO12	maps moderately	The knowledge of mathematical principles and different clipping algorithms will help students to understand different clipping techniques (Point clipping, line clipping, text clipping, curve clipping)
	PO4	Maps slightly	Students can analyze how clipping is applied for any type of figures, text. and curve
CO6	PO1 PO2	Maps Substantially	Using the basics of mathematics will help us to apply geometric transformations like translation, rotation, scaling, shear, reflection.
	PO3 PO5 PO9 PO12	maps moderately	Using geometric transformations students will be able to design any 2d and 3d objects and create animated projects (such as games, sceneries)
	PO4	Maps slightly	Students will be able to analyze and find different methodology

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS71- Web Technology and its Applications

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO 4
CO1	Adapt HTML and CSS syntax and semantics to build web pages.	2	-	2	-	2	-	-	-	1	-	1	2	2	2	3	-
CO2	Construct and visually format tables and forms using HTML and CSS	2	-	2	-	2	-	-	-	1	-	1	2	2	2	2	-
CO3	Develop Client-Side Scripts using JavaScript	2	2	3	1	3	-	-	-	2	1	2	3	3	3	3	-
CO4	Develop Server-Side Scripts using PHP	2	1	2	1	3		-	-	2	1	2	3	3	3	3	-
CO5	Appraise the principles of object oriented development using PHP	2	1	3	1	3	-	-	-	2	2	2	3	3	2	3	2
CO6	Inspect JavaScript frameworks jQuery and Backbone	2	1	3	1	3	-	-	-	3	2	2	3	3	3	3	-

	PO	Level	Justification
CO1	PO1 PO3 PO5	maps moderately	The basic knowledge of computer science will help the students to understand Structure , Semantic of markup languages
	PO9 PO11	Maps slightly	The basic knowledge of markup languages will help the students to build own web page.

CO2	PO1 PO3 PO5 PO12	Maps moderately	The basic knowledge of computer science will help the students to understand usage of Cascading Style Sheets
	PO9 PO11	Maps slightly	The knowledge of Cascading Style Sheets helps the students create their own web page.
CO3	PO1 PO5 PO9 PO11	Maps moderately	The basic knowledge of computer science will help the students to understand concept of different scripting languages which helps to validate information.
	PO3 PO5 PO12	Maps Strongly	Understand Java Scripts to verify and validate form inputs Interaction with client browsers
	PO4 PO10	Maps slightly	Interaction with real world-to collect data
CO4	PO1 PO3 PO9 PO11	Maps moderately	Interaction with server side technologies like PHP supports data processing and storage Dynamic Response generation
	PO2 PO4 PO10	Maps slightly	Interaction & Data Collection from clients and processing at server side.
	PO5 PO12	Maps Strongly	Develop dynamic client - server applications
CO5	PO3 PO5 P012	Maps Highly	The knowledge of server side Scripting language will help the students to understand client server application which will enhance the students to design different web pages.
	PO1 PO9 PO10 PO11	maps moderately	The knowledge of computer science will help the students to understand client/server design.
	PO2 PO4	Maps slightly	The knowledge so gained will form the basis for interpreting the client server design concepts.

CO6	PO3 PO5 PO9 PO12	Maps Highly	The knowledge of jQuery and Backbone frameworks will help the students to design and develop web sites.
	PO1 PO10 PO11	Maps moderately	The knowledge of computer science will help the students to understand fundamentals of framework.
	PO2 PO4	Maps slightly	The basic knowledge of will enable the students to analyze different frameworks.

	PSO	**Level**	**Justification**
CO1	PSO1	maps moderately	The basic knowledge of computer science and its fundamentals will help the students to understand Structure , Semantic of markup languages will lay down solid foundation for Engineering
	PSO3	Maps slightly	The basic knowledge of markup languages will help the students to help them to build web pages in future.
CO2	PSO1 PSO2 PSO3	Maps slightly	The basic knowledge of computer science will help the students to understand usage of Cascading Style Sheets which will help to build the Carrier in software industry.
CO3	PSO1 PSO2 PSO3	Maps moderately	The basic knowledge of computer science will help the students to understand concept of different scripting languages which helps to design and validate information in industrial applications
CO4	PSO3	Maps moderately	The knowledge of Document object model (DOM) will help the students to design dynamic web pages which will be useful in software industry..
	PSO1 PSO2	Maps slightly	The knowledge of Regular Expression will help the Students analyze information dynamically which will help the students to learn computer fundamentals.
CO5	PSO3	Maps Highly	The knowledge of Scripting languages will help the students to understand client server application which will enhance the students to design their own web pages.
	PSO1 PSO2 PSO4	maps moderately	The knowledge of computer science will help the students to understand client/server design which will ensure the authenticate and confidentiality.
CO6	PSO2 PSO3	maps moderately	The knowledge of computer science will help the students to understand fundamentals of framework which will be used for the benefits of society.

15CS72-ADVANCED COMPUTER ARCHITECTURE

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Understand the concepts of parallel computing	2	-	-	-	-	-	-	-	-	-	-	1	2	-	1	-
CO2	Demonstrate the concepts of hardware technologies	2	-	-	-	-	-	-	-	-	-	-	1	2	-	1	-
CO3	Explore bus, cache, shared memory with pipelining and super scalar techniques	2	1	-	-	-	-	-	-	-	-	-	1	2	-	1	-
CO4	Classify parallel architecture	2	1	1	-	-	-	-	-	-	-	-	1	2	-	1	-
CO5	Assess Scalable architecture	2	1	1	-	-	-	-	-	-	-	-	1	2	-	1	-
CO6	Investigate parallel programming concept	2	1	1	-	-	-	-	-	-	-	-	1	2	-	1	-

CO1	PO	Level	Justification
	PO1	maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and identify various computer architecture and ,analyse its performance . Understand the recent developments and life-long learning.
	PO12	Maps slightly	Performance anlaysis helps the students to gain the research based knowledge
CO2	PO1	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same in understanding the concepts of hardware technologies
	PO12	Maps slightly	Students explore existing architecture of processor, which creates an opportunity to design a new architecture
CO3	PO1	Maps slightly	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and exploit different super scalar techniques
	PO2 PO12	Maps moderately	Challenges and opportunities of shared memory and cache techniques has been analyzed.
CO4	PO1	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and exploit different parallel architecture
	PO2 PO3 PO12	Maps slightly	Parallel architecture classification study needs some knowledge of problem analysis and design alternatives. This willhelp the students to going for their higher studies in design and development areas
CO5	PO1	maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same in classification of Scalable architecture
	PO2 PO3 PO12	Maps slightly	Scalable architecture classification study needs some knowledge of problem analysis and design alternatives. This willhelp the students to going for their higher studies in design and development areas
CO6	PO1	maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same in parallel programming concepts
	PO2 PO3 PO12	Maps slightly	Parallel programming concept needs some knowledge of problem analysis and design alternatives. This will help the students to going for their higher studies in design and development areas

15CS73-Machine Learning

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Understand machine learning and problems relevant to machine learning	2	1	1									1	2		2	2
CO2	Analyze concept learning and decision trees.	2	2	1	1	1				1			2	2	1	2	2
CO3	Apply artificial neural networks inmachine learning.	2	2	1	2	1				1			2	2	1	2	2
CO4	Interpret and realize Bayesian methods	2	2	1	2	1				1			2	2	1	2	2
CO5	Investigate instance based learning	2	2	1	2	1				1			2	2	1	2	2
CO6	Evaluate hypothesis and examinereinforcement learning. .	2	2	1	2	1				1			2	2	1	2	2

CO1	**PO**	**Level**	**Justification**
	PO1,	maps moderately	Knowledge of various machine learning approaches involves solving complex engineering problems.
	PO2, PO3, PO12	Maps slightly	Principles of mathematics and engineering sciences are used in various aspects of machine learning approaches. Using the knowledge of supervised learning concepts, we can design and develop solutions for complex engineering problems. Expertise developed, which will enable the student to become a productive member of a design team.
CO2	PO1, PO2, PO12	Maps moderately	Comparative study of different dimensionality reduction techniques involves solving complex engineering problems. Principles of mathematics and engineering sciences are used in various aspects of dimensionality reduction techniques.
	PO3 PO4 PO5 PO9	Maps slightly	Knowledge of dimensionality reduction techniques can be used to design and develop solutions for complex engineering problems.
CO3	PO1, PO2, PO4. PO12	Maps moderately	Knowledge of theoretical foundations of decision trees involves solving complex engineering problems. Theoretical foundations of decision trees to identify best split and Bayesian classifier to label data points knowledge can be used to design and conduct experiments to provide valid conclusions
	PO3 PO5 PO9	Maps slightly	Expertise developed, which will enable the student to become a productive member of a design team.
CO4	PO1,PO2, PO4, PO12	Maps maderately	Knowledge of classifier models applications helps in solving complex engineering problems.
	PO3 PO5 PO9	Maps slightly	Knowledge of classifier models can be used to design and develop solutions for complex engineering problems
CO5	PO1, PO2, PO4, PO12	Maps moderately	State sequence identification and sequence emission probability evaluation skills can be used to design and conduct experiments to provide valid conclusions.
	PO3 PO5 PO9	Maps slightly	Sequence emission probability evaluation knowledge can be used to design and develop solutions for complex engineering problems
CO6	PO1,PO2, PO4,PO12	Maps moderately	Knowledge of clustering algorithms involves solving complex engineering problems.
	PO3 PO5 PO9	Maps slightly	Clustering algorithms can be used to design and develop solutions for complex engineering problems

CO	PSO	LEVEL	Justification
CO1	PSO1, PSO3, PSO4	Maps moderately	Various learning approaches Acquire skills to design, analyse and develop algorithms and implement themusing high-level programming languages.
	PS02	Maps slightly	Knowledge of supervised learning concepts contribute skills in computing and knowledge engineering domain.
CO2	PSO1, PSO3, PSO4	Maps moderately	Knowledge of different dimensionality reduction techniques Acquire skills to design, analyse and develop algorithms and implement them using high level programming languages.
	PSO2	Maps slightly	Different dimensionality reduction techniques concepts contribute skills in computing and knowledgeengineering domain.
CO3	PSO1, PSO3, PSO4	Maps moderately	Theoretical foundations of decision trees to identify best split and Bayesian classifier Acquire skills to design,analyse and develop algorithms and implement them using high-level programming languages.
	PSO2	Maps slightly	Theoretical foundations of decision trees and Bayesian classifier contribute skills in computing and knowledge engineering domain.
CO4	PSO1, PSO3, PSO4	Maps moderately	Study of classifier model working acquire skills to design, analyse and develop algorithms and implement them using high-level programming languages
	PSO2	Maps slightly	Identification of classifier model application area contribute skills in computing and knowledge engineering domain.
CO5	PSO1, PSO3, PSO4	Maps moderately	Design and implement a parallel machine learning algorithm on top of the Hadoop framework for a research problem.
	PSO2	Maps slightly	Machine learning draws on concepts and results from many Engineering fields.
CO6	PSO1, PSO3, PSO4	Maps moderately	Machine Learning algorithms applied for the real world problem like Games, Robot etc. Machine Learning problem apply for Research problem.
	PSO2	Maps slightly	Machine Learning algorithm uses different Engineering fields concept.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS741-NATURAL LANGUAGE PROCESSING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Understand the challenges and applications of NLP.	1		2										1		1	
CO2	Illustrate semantics and pragmatics of language for NLP.	2	2	2	2								1	2			2
CO3	Analyze the natural language text at word level and semantic level.	2	3	2	2								1	2			
CO4	Establish dependency path and annotate knowledge role.	2	3	2										2			1
CO5	Demonstrate techniques and tools used in Text mining.	2	2	2	2	1							2	1	2	1	
CO6	Explore various information retrieval techniques.	2	2	2	1								2	2		1	

	PO	Level	Justification
CO1	PO1,	Maps slightly	The basics of computer science will help the students to understand the applications and challenges of NLP.
	PO3	Maps moderately	Identification of Design solutions help the students to understand the applications of NLP
CO2	PO1 PO2, PO3 PO4	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to analyse, formulateand develop a design solution to research based problem
	PO12	Maps slightly	Students explore recent trends in NLP

CO3	PO1 PO3 PO4	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to analyse theNatural Language at word level and semantic level which can be a research based problem.
	PO2	Maps substantially	Identify, formulate and analyse the natural language text at word level and semantic level.
	PO12	Maps slightly	Recent trends in Analysis of natural language text can be explored.
CO4	PO1 PO3	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and design solution to the dependency path and annotate knowledge role.
	PO2	Maps substantially	Analyse the dependency path and formulate the annotations knowledge role.
CO5	PO1, PO2, PO3, PO4, PO12	maps moderately	The basics of computer science will help the students to analyse, design solutions using various tools and techniquesfor the text mining.
	PO5	Maps slightly	Students explore modern programming techniques and tools.
CO6	PO1, PO2, PO3, PO12	maps moderately	The basics of computer science will help the students to analyse, design and develop solutions for variousInformation retrieval. Students can look into current trends in IR.
	PO4	Maps slightly	Students identify the design components of recent trends in IR.

	PSO	**Level**	**Justification**
CO1	PSO1 , PSO3	Maps slightly	The solid foundation in the principles and practices of computer science will help the students to understandthe challenges and applications of NLP and develop their professional knowledge.
CO2	PSO1 , PSO4	Maps moderately	Solid foundation in the principles and practices of computer science will help the students to practice theprofession with ethics.
CO3	PSO1	Maps moderately	Solid foundation in the principles and practices of computer science will help the students to analyse theNatural language text.
CO4	PSO1.	Maps moderately	Solid foundation in the principles and practices of computer science is required for the students to understand the relation extraction by dependency graph.
	PSO4	Maps Slightly	Relation extraction by dependency graph help the students to practice the profession with ethics.
CO5	PSO1 PSO3	Maps Slightly	Foundation of computer science is essential for the students to apply various techniques and tools used in text mining, and helps students to build their careers in the software industry
	PSO2	Maps moderately	Modern techniques and tools aid students to develop skills to function as members of multidisciplinary teamsand to communicate effectively using modern tools
CO6	PSO1	Maps moderately	Basics of computer science is required to explore various information retrieval techniques.
	PSO3	Maps Slightly	IR techniques will help the students to build their careers in the software industry

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS744-UNIX SYSTEM PROGRAMMING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Distinguish among ANSI C & POSIX standards	2		1	1								2	1		2	-
CO2	Illustrate UNIX Kernel support for files	1		1	2	1							2	1		2	
CO3	Understand Kernel support for process	1		2	1								2	2		2	
CO4	Interpret Process Accounting, process UID ,Terminal logins, network logins	1		2	1								2	2		2	
CO5	Analyze process control, Deamon characteristics, coding rules and error logging	1		1	1	1							1	2		1	
CO6	To build an application/service over a UNIX system	1		1	1	1				1		1	3	2	3	2	1

	PO	Level	Justification
CO1	PO1	Maps Moderately	Fundamental knowledge of ANSI C and POSIX standards are required.
	PO3	Maps Slightly	Understanding complex OS operations are understood by understanding systems calls in C
	PO4	Maps Slightly	Interpretation of data being passed in OS between process, terminals and different networks
	PO12	Maps Moderately	Understanding basic working of OS and future system level applications.
CO2	PO1	Maps Slightly	Fundamental understanding of files and UNIX representation of files.

	PO3	Maps Slightly	Complex OS operations related to files like soft link and hard link are understood in basic manner.
	PO4	Maps Moderately	Creating IPC and using UID to start and kill the process helps in understanding the tasks of OS
	PO5	Maps Slightly	Modern tools are used to identify file id, uid
	PO12	Maps Moderately	Files are integral part of all types of programs
CO3	PO1	Maps Slightly	Understanding the fundamentals of process creation, process deletion and process management
	PO3	Maps Moderately	Different types of application requires the thorough understanding of process
	PO4	Maps Slightly	Interpretation of P-table that holds all the necessary information related to process
	PO12	Maps Moderately	Communication and usage of system calls are integral part of programming life cycle
CO4	PO1	Maps Slightly	Understanding how login's are created and used
	PO3	Maps Moderately	Client-Server model needs the knowledge of network login creation
	PO4	Maps Slightly	Complex system program such as device drivers and other system programs require knowledge of login
	PO12	Maps Moderately	Different types of application requires the thorough understanding of different types of login
CO5	PO1	Maps Slightly	Understanding the basics of daemon process formation
	PO3	Maps Slightly	Complexity involved in creating daemon process and maintenance of the same by OS routines
	PO4	Maps Slightly	Coding rules must be adopted in research based and application programs
	PO5	Maps Slightly	Modern tools can be used to analyse daemon process formation and maintenance
	PO12	Maps Slightly	Inculcating the concepts of daemon process and coding standards and error debugging is a life time process
CO6	PO1	Maps Slightly	Understanding UNIX OS structure and building a simple application over it.
	PO3	Maps Slightly	Application programs require extensive usage of system calls
	PO4	Maps Slightly	Interpretation of data related to process, in terms of their storage, usage and updation.
	PO5	Maps Slightly	Modern tools can be used to analyse system call working
	PO9	Maps Slightly	System call implementation needs integration of several programmers
	PO12	Maps Slightly	Inculcating the concepts of system calls and coding standards and error debugging is a life time process

	PSO	Level	Justification
CO1	PSO1	Maps Slightly	A strong foundation of basics of OS will be understood.
	PSO3	Maps Moderately	Basic understanding will help graduates to acquire necessary skills to perform as an individual
CO2	PSO1	Maps Slightly	Fundamental understanding of files and UNIX representation of files.
	PSO3	Maps Moderately	Complex OS operations related to files like soft link and hard link are understood in basic manner.
CO3	PSO1	Maps Moderately	Understanding the fundamentals of process creation, process deletion and process management.
	PSO3	Maps Moderately	Different types of application requires the thorough understanding of process
CO4	PSO1	Maps Moderately	Understanding how logins are created and used
	PSO3	Maps Moderately	Client-Server model needs the knowledge of network login creation
CO5	PSO1	Maps Moderately	Understanding the basics of daemon process formation
	PSO3	Maps Slightly	Complexity involved in creating daemon process and maintenance of the same by OS routines
CO6	PSO1	Maps Moderately	Understanding UNIX OS structure and building a simple application over it.
	PSO2	Maps Substantially	Application programs require extensive usage of system calls
	PSO3	Maps Moderately	Interpretation of data related to process, in terms of their storage, usage and updation.
	PSO4	Maps Slightly	Modern tools can be used to analyse system call working

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS754 -SAN

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Examine the Storage Area Networks characteristics, components and storage architectures	1											1	1		1	1
CO2	Exemplify the concept of RAID and their suitability for different application environments	1	2	1	1								1	1		1	1
CO3	Analyze file sharing operations on NAS and IP-SAN of the different networks	1	1										1	1		1	1
CO4	Depict the working of Storage Virtualization on Various levels of Storage	1											1	1		1	1
CO5	Illustrate the concepts of business continuity and disaster recovery in a storage infrastructure	1											1	1		1	1
CO6	Demonstrate the Knowledge of Securingthe local replication in Storage Infrastructure and Cloud	1											1	1		1	1

CO	PO	Mapping level	Justification
CO1	Slightly	Slightly	As the students are required to focus on the fundamentals of Storage Area Networks characteristics, components and storagearchitectures.
CO2	PO2	Moderately	Students can gain concept of RAID and their suitability for different application environments gives the orientation towardsproblem solving capability

	PO1 PO3 PO4	Slightly	Maps slightly to the Knowledge on RAID and the different application environments as it leads towards enhancing the basicfundamental problem solving capability.
CO3	PO1 PO2 PO12	Slightly	Analysis of file sharing operations on NAS and IP-SAN of the different networks helps them to apply the engineeringknowledge which leads to identify the problem statement.
CO4	PO1 PO12	Slightly	Students can have basic knowledge on the working of Storage Virtualization on Various levels of Storage at this level whichwill be helpful to apply gained knowledge in future
CO5	PO1 PO12	Slightly	As the Students are able to only Illustrate the concepts of business continuity and disaster recovery in a storage infrastructure itmaps slightly.
CO6	PO1 PO12	Slightly	Students can Demonstrate the Knowledge of Securing the local replication in Storage Infrastructure and Cloud.

CO	**PSO**	**Mapping level**	**Justification**
CO1	PSO1 PSO3 PSO4	Slightly	Graduates will use the solid foundation in the principles of computer science to understand Storage Area Networks characteristics, components and storage architectures during their career in software industry or while pursuing higher studies.
CO2	PSO1 PSO3 PSO4	Slightly	Graduates will use the solid foundation in the principles of computer science to interpret the concept of RAID and their suitability for differentapplication environments during their career in software industry or while pursuing higher studies.
CO3	PSO1 PSO3 PSO4	Slightly	Graduates will use the solid foundation in the principles of computer science to analyze file sharing operations on NAS and IP-SAN of thedifferent networks during their career in software industry or while pursuing higher studies.
CO4	PSO1 PSO3 PSO4	Slightly	Graduates will use the solid foundation in the principles of computer science to develop the capability to analyze working of StorageVirtualization on Various levels of Storage during their career in software industry or while pursuing higher studies.
CO5	PSO1 PSO3 PSO4	Slightly	Graduates will use the solid foundation in the principles of computer science Illustrate the concepts of business continuity and disaster recovery in a storage infrastructure during their career in software industry or while pursuing higher studies.
CO6	PSO1 PSO3 PSO4	Slightly	Graduates will use the solid foundation in the principles of computer science to Demonstrate the Knowledge of Securing the local replication in Storage Infrastructure and Cloud during their career in software industry or while pursuing higher studies.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CSL76-Machine Learning Laboratory

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Implement and demonstrate the concept learning algorithms (FIND-S, Candidate-Elimination)	2	2	2									2	2	1	2	
CO2	Demonstrate the working of the decision tree and apply this knowledge to classify a new sample. (ID3)	2	2	2		1							2	2	1	2	
CO3	Build an Artificial Neural Network by implementing the Back propagation algorithm.	2	2	2		1							2	2	1	2	
CO4	Apply the naïve Bayesian classification methods and build Bayesian network.	2	2	2	2	1							2	2	1	2	
CO5	Implement EM algorithm, k-means and Compare their results.	2	2	2	2	1							2	2	1	2	
CO6	Investigate instance based and regression algorithms.	2	2	2		1							2	2	1	2	

	PO	Level	Justification
CO1	PO1, PO2, PO3, PO12	maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the samein life long learning. Life long learning is involved to bring technological change.
CO2	PO1, PO2, PO3, PO12	Maps moderately	To develop the decision tree, engineering knowledge is needed to analyze the problem and to develop the solution.Life long learning is involved to bring technological change.
	PO5	Maps slightly	Tools are used to generate the tree.
CO3	PO1, PO2, PO3, PO1 2	Maps substantially	Students uses engineering knowledge and mathematical principles to analyze and to develop the solutions for Artificial Neural Networks and apply the same in life long learning to bring technological changes.
	PO5	Maps slightly	Conduct investigation on complex problems by making use of tools.
CO4	PO1, PO2, PO3, PO4, PO12	Maps substantially	To learn Bayesian Networks, engineering knowledge is required to analyze and develop solutions. Life long learning is involved to bring technological change.
	PO5	Maps slightly	Some libraries in Python are used to develop graphs..
CO5	PO1, PO2, PO3, PO4, PO12	Maps moderately	Gained knowledge on computational problems like K-Means and EM Algorithm. Developed solution for the same.Also documentation is maintained.
	PO5	Maps slightly	Solution is developed using Python Idle and developed solution is useful to society.
CO6	PO1, PO2, PO3, PO12	Maps moderately	After analyzing the algorithms, students are able to develop the solution and can conduct further investigation for complex problems. Life long learning is involved to choose the algorithmic techniques inorder to improve the efficiency and to bring some technological changes.
	PO5	Maps slightly	Appropriate techniques are used to develop the solution.

CO	PSO	LEVEL	Justification
CO1	PSO1, PSO3	Maps moderately	The graduates of the Program will have solid foundation in the principles and practices of computer science, including mathematics, science and basic engineering to solve simple computational problems. Through this graduates will be prepared for their careers in software industry.
	PS02	Maps slightly	Solution is developed using Python Idle and can be used in multi disciplinary teams.
CO2	PSO1, PSO3	Maps substantially	Enables to gain knowledge on Decision Trees.
	PSO2	Maps slightly	Knowledge on Decision Trees will help the students to work in multi disciplinary teams.
CO3	PSO1, PSO3	Maps substantially	Students will get solid foundation on graph/network based problems.
	PSO2	Maps slightly	All these solutions are developed in Python Idle.
CO4	PSO1, PSO3	Maps moderately	Graduates will be prepared for the careers, and to gain professional knowledge.
	PSO3	Maps slightly	Combinatorial problems solutions are developed using Pyhton Idle.
CO5	PSO1, PSO3	Maps moderately	Knowledge on computational problems will give strong foundation on mathematical principles. And also higher studies can be made on this.
	PSO2	Maps slightly	Computational problems are developed using Python Idle.
CO6	PSO1, PSO3	Maps moderately	Solutions are given to instance based problems. To do this, strong mathematical background is required. Onceanalysis is done, solutions are developed which would be helpful to start careers in the software industry.
	PSO2	Maps slightly	Instance based problems knowledge can be applied in multi disciplinary teams.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CSL77 -WEB TECHNOLOGY & ITS APPLICATIONS LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Develop web pages using HTML5 and CSS.	2											1	2		1	2
CO2	Design dynamic web pages using JavaScript	2	1	2		1				1		1	2	2		1	2
CO3	Create interactive web applications using PHP.	2	2	2	1	2				1		1	2	2		2	1
CO4	Explore different Web Services, Internet Tools and Database	2	1	2	1	2				1	1	1	2	2	1	2	2
CO5	Design and Develop Web project	2	1	2		2				1	2	1	2	2	1	2	2
CO6	Evaluate and Document Web project	2	1	2		3					2		2	1	1	2	2

CO1	**PO**	**Level**	**Justification**
	PO1	maps moderately	Students will be able to apply the knowledge of engineering fundamentals to understand the elements and attributes of web pages.
	PO12	Maps slightly	Help students to recognize the need for web pages in front-end development.
CO2	PO1 PO3 PO12	Maps moderately	Students can apply the knowledge of engineering fundamentals to design front-end using HTML and CSS that meet the specifiedneeds. Also help them to recognize the need for CSS to engage in independent and life-long learning.
	PO2 PO5 PO9 PO11	Maps slightly	The knowledge of CSS and HTML5 help students to analyze engineering problems using modern engineering and IT tools, this also helps to be a member or leader in diverse teams and apply these to one's own work.
CO3	PO1 PO2 PO3 PO5 PO12	Maps slightly	Graduates can apply the knowledge of engineering fundamentals to design interactive pages using JavaScript also can analyze engineering problems and design solutions using modern engineering and IT tools. Students will be able to engage in independent and life-long learning.
	PO4 PO9 PO11	Maps moderately	JavaScript will be used in research.Help student to be a member or leader in diverse teams.Graduates can use JavaScript concepts in Project management.
CO4	PO1 PO3 PO5 PO12	Maps moderately	Graduates can apply the knowledge of PHP in Design/development of solutions using modern engineering and IT tools, it also helps them to engage in independent and life-long learning.
	PO2 PO4 PO9 PO10 PO11	Maps slightly	Knowledge of PHP helps analyzing engineering problems and can be used in research. This helps them to be a member or leader in diverse teams. PHP helps in client server Communication and one can apply these to one's own work, as a member and leader in a team, to manage projects.
CO5	PO1 PO3 PO5 PO10 PO12	maps moderately	Students can apply the knowledge of PHP, JQuery to design server side applications that meet the specified needs using modern engineering and IT tools..
	PO2 PO9 PO11	Maps slightly	The knowledge of Javascript & PHP help students to analyze engineering problems, this also helps to be a member or leader in diverse teams and apply these to one's own work.
CO6	PO5	Maps substantially	JQuery framework will be used to model complex engineering activities with an understanding of the limitations.
	PO1 PO3 PO10 PO12	maps moderately	Graduates can apply the knowledge of PHP in Design/development of solutions and Java Script supports Client side scripting and also helps them to engage in independent and life-long learning.
	PO2	Maps slightly	Knowledge of full stack web helps analyzing engineering problems and can be used in research.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

PROJECT WORK PHASE 1 (15CSP78)

	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Survey on various technological domains	3	3	2	1	-	-	-	-	1	-	2	-	1	-	2	-
CO2	Identify problem statement and objectives	2	2	2	1	-	-	-	-	-	-	-	-	1	-	2	-
CO3	Formulate different requirements, phases and functionalities	-	1	1	2	1	-	-	-	2	-	-	1	1	2	2	1
CO4	Design system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules	1	1	2	2	1	2	1	-	-	-	-	-	1	1	2	-
CO5	Build algorithms, code implementation, testing and validation	1	2	-	3	1	-	-	-	1	1	-	1	-	3	3	-
CO6	Prepare the project report	-	-	-	3	2	-	-	-	-	1	1	-	-	3	1	-

	PO	Level	Justification
CO1	PO1 PO2	Maps Substantial(High)	The students can able to survey on various technological domains and they can identify problem statement
	PO3 PO11	Maps Moderate(Medium)	Survey on different technological domains slightly hard for the students
	PO4 PO9	Maps Slight(Low)	Research based knowledge and research methods, analysis and interpretation of data and multidisciplinary task are difficult here
CO2	PO1 PO2 PO3	Maps Moderate(Medium)	Student required knowledge for identifying problem and creating problem statement and objectives
	PO4	Maps Slight(Low)	Student may require strong knowledge on research methods for analysis and implementation after the problem statements
CO3	PO4 PO9	Maps Moderate(Medium)	Student required knowledge for formulate different requirements, phases, functionalities and interdisciplinary actions
	PO2 PO3 PO5 PO12	Maps Slight(Low)	Student may require strong knowledge to formulate different requirements, phases, functionalities and interdisciplinary actions based on context of technological change.
CO4	PO3 PO4 PO6	Maps Moderate(Medium)	Designing and implementing of system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules will be complex process... Adopting ethical principles in multidisciplinary environments is tough task
	PO1 PO2 PO5 PO7	Maps Slight(Low)	The students required strong mathematical concepts and system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules solve complex problems. The student will have learn life-long in context of technological change
CO5	PO4	Maps Substantial(High)	The student have research-based knowledge and research methods including build algorithms, code implementation, testing and validation, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
	PO2	Maps Moderate(Medium)	The students can able build algorithms, code implementation, testing and validation
	PO1 PO5 PO9 PO10 PO12	Maps Slight(Low)	The students have to required strong mathematical knowledge for build algorithms, code implementation, testing and validation
CO6	PO4	Maps Substantial(High)	The students can able write project report on research methods including build algorithms, code implementation, testing and validation, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
	PO5	Maps Moderate(Medium)	The students can able to create project report /documents using modern tools and techniques

	PO10 PO11	Maps Slight(Low)	The students have to required write mathematical concepts in their project report and being able to comprehend and write effective reports and design documentation is low at the undergraduate level

	PSO	Level	Justification
CO1	PSO1	Maps Moderate (Medium)	The students have moderate knowledge on various technological domains through literature survey
	PSO3	Maps Slight (Low)	The graduates have limited opportunity to build their career in the software industry
CO2	PSO1	Maps Moderate (Medium)	The students have moderate knowledge on various technological domains to identify problemstatement and to set objectives
	PSO3	Maps Slight (Low)	The graduates have limited opportunity in industry just by identifying problem statement andobjectives
CO3	PSO1 PSO4	Maps Moderate (Medium)	The students have moderate knowledge on various technological domains to formulate differentrequirements and functionalities of different phases.
	PSO2 PSO3	Maps Slight (Low)	The graduates have limited opportunity in industry by knowing different functionalities andrequirements.
CO4	PSO1 PSO2	Maps Moderate (Medium)	The students have moderate knowledge in designing a software system through system architecture,DFD, different modules
	PSO3	Maps Slight (Low)	The graduates have limited opportunity in software industry or pursue higher studies
CO5	PSO2 PSO3	Maps Substantial (High)	The students will able to design, build algorithms, code implementation, testing and validation of project whichenable greater opportunities to work in IT industries.
CO6	PSO1 PSO2	Maps Substantial (High)	The students are able to prepare the best project report by having domain knowledge and effectivecommunication for best business opportunities
	PSO3	Maps Slight (Low)	The graduates have limited opportunity to pursue higher studies

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS81-INTERNET OF THINGS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Interpret the impact and challenges posed by IoT networks leading to new architectural models.	1	0	0	0	0	0	2	0	0	0	0	1	1	0	1	0
CO2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.	2	0	0	0	0	0	2	0	0	0	0	2	1	0	1	0
CO3	Appraise the role of IoT protocols for efficient network communication.	2	0	0	0	1	0	2	0	0	0	0	2	2	0	1	0
CO4	Elaborate the need for Data Analytics and Security in IoT.	2	0	0	0	1	0	2	0	0	0	0	2	2	0	1	0
CO5	Illustrate different sensor technologies for sensing real world entities	1	1	3	0	1	0	2	0	0	0	0	3	1	0	2	0
CO6	Explore the applications of IoT in Industry	1	1	3	0	2	0	2	0	0	0	0	3	1	0	2	0

	PO	Level	Justification
CO1	PO1 PO12	Maps slightly	The knowledge of basics of mathematical and engineering principles help students to demonstrate the principles of different architecture. Analysis of different elements of architecture help students to understand the existing system. Life long learning required to bring in the new developments in the upcoming applications.
	PO7	Maps moderately	Development of any new standardization architecture needs analysis and design procedures of new elements and understanding the impact on societal and environmental contexts
CO2	PO1 PO7 PO12	Maps moderately	The knowledge of basics of mathematical and engineering principles help students for the smart object analysis and design procedures of new connecting and understanding the impact on societal and environmental contexts.
CO3	PO1 PO7 PO12	Maps moderately	It helps students to come up with design strategies of any modifications required and induces life long learning
	PO5	Maps slightly	Networking concepts are applied in various domains and hence it is relevant to relate network layer services to understand the impact of the professional engineering solutions in societal and environmental contexts
CO4	PO1 PO7 PO12	Maps moderately	Networking concepts are applied in various domains in day to day activities and hence induces life long learning. Tools like NS3 help students and to realize the working of protocols.The knowledge of strong basics of mathematical and engineering principles help students to demonstrate the principles of application layer protocols.
	PO5	Maps slightly	It enables student in Debugging solutions for complex problems.
CO5	PO3 PO12	Maps Strongly	Frequent upgrades of Data Analytics induce life long learning and the environment friendly impact on design and utilization of servers are important.
	PO7	Maps moderately	Environment friendly impact on design and utilization of server data are important.
	PO1 PO2 PO5	Maps slightly	The knowledge of basics of mathematical and engineering principles help students for the transport layer analysis and design procedures of new analytics techniques and understanding the impact on societal and environmental contexts.
CO6	PO3 PO12	Maps Strongly	Applications to industry and regular updates in the domain leads to life long learning.
	PO5 PO7	Maps moderately	Optimal applications is considered to be effective in optimal environmental conditions and minimal resource usage.
	PO1 PO2	Maps slightly	The knowledge of basics of mathematical and engineering principles help students for the applications and analysis.

	PSO	Level	Justification
CO1	PSO1 PSO3	Maps slightly	Architecture design concepts are applied in various domains and hence students will gain skills to function as members of multi-disciplinary teams
CO2	PSO1 PSO3	Maps slightly	Architecture analysis and new implementation and standardization requires lifelong learning.
CO3	PSO1	Maps moderately	The knowledge of strong basics of mathematical principles and computer architecture will help the students toidentify and apply functionalities of different network layer protocols.
	PSO3	Maps slightly	Development of any new network layer protocol needs the understanding of its working in multidisciplinary environment and requires longevity of learning
CO4	PSO1	Maps moderately	Networking concepts are applied in various domains in day to day activities and hence induces life long learning.
	PSO3	Maps slightly	The knowledge of strong basics of mathematical and engineering principles help students to demonstrate the principles ofapplication layer protocols. It enables student in Debugging solutions for complex problems.
CO5	PSO3	Maps moderately	Frequent upgrades of Data Analytics technique induces life long learning.
	PSO1	Maps slightly	The knowledge of mathematical principles and basics of computer science will help the students to understand the concepts of different analytic principles and overview
CO6	PSO3	Maps moderately	Application of IOT in different fields is multidisciplinary and regular updates in the domain leads to life long learning.
	PSO1	Maps slightly	Solid foundation in mathematical and science fundamentals is important for the different applications of IOT.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS82- Big Data Analytics

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Master the concepts of HDFS and MapReduceframework	2	1	1	2	1							1	1	1	1	
CO2	Investigate Hadoop related tools for Big Data Analytics and perform basic Hadoop Administration	1	2	2	2	1							1	1	1	2	
CO3	Recognize the role of Business Intelligence, Data warehousing and Visualization in decision making	1	1	1	1	1							1	1	1	2	
CO4	Infer the importance of core data miningtechniques for data analytics	1	2	1	2	1							1	1	2	1	
CO5	Compare and Analyze different contrast differentText Mining Techniques	1	1	1	2	1							1	1	2	1	
CO6	Explore the applications of Social Networkingand Web mining Techniques	1	2	2	2	1							1	1	1	1	

	PO	Level	Justification
CO1	PO1 PO4	maps moderately	The basic knowledge of computer science will help the students to understand HDFS and its applications
	PO2 PO3 PO5 PO12	Maps slightly	The basic knowledge of MapReduce Framework will help the students to understand parallel computations
CO2	PO2 PO3 PO4	Maps moderately	The knowledge of Apache Ambari operation helps to understand Hadoop administration and interaction with Hadoop tools like pig, hive and Oozie
	PO1 PO5 PO12	Maps slightly	The knowledge of Apache Scoop and Apache Flume helps to interact with Database and real data stream acquirement.
CO3	PO1 PO2 PO3 PO4 PO5 PO12	Maps Slightly	The knowledge of Business Intelligence and Data Visualization Techniques helps students to understand real word data categories and different Data Analytics Techniques
CO4	PO2 PO4	Maps moderately	Understand different Data Mining Operations and its applications in Knowledge Discovery Process
	PO1 PO3 PO5 PO12	Maps slightly	Explore different Data Preprocessing operations which are preliminary before the use of data mining techniques.
CO5	PO4	maps moderately	The knowledge of Text Data Mining will help the students to understand different categories of text data, analysis and processing.
	PO1 PO2 PO3 PO5 PO12	Maps slightly	The knowledge so gained will form the basis for interpreting different forms of text data in real world and knowledge extraction.
CO6	PO1 PO5 PO12	Maps Moderately	The basics of Data Mining helps to analyze social networks and explore specific techniques used to perform social network analysis.
	PO2 PO3 PO4	Maps Slightly	The web mining approaches helps to analyze web data and extract useful patterns from web data

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

15CS832-UID

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	To understand the concepts of menus, windows and interfaces	1											1	1		1	
CO2	To comprehend various business functions	1	2	1	1								1	1		1	
CO3	To analyze the characteristics and components of windows	1	1										1	1		1	
CO4	To demonstrate the various controls of windows	1											1	1		1	
CO5	To study the various problems in windows with respect to color textand graphics	1											1	1		1	
CO6	To apply the various testing methods	1											1	1		1	

CO	PO	Mapping level	Justification
CO1	PO1 PO2	Slightly	As the students are required to focus only on the fundamentals of menus, windows and interfaces and lays foundation it only it maps slightly
CO2	PO1 PO2 PO2 PO3 PO4 PO12	Moderately	As the students are required to interpret the various business functions which lays the foundation for them to build mathematical modeling ability and hence maps moderately
CO3	PO1 PO2 PO12	Slightly	As the students analyze the characteristics and components of windows which further enhances their ability to identify the problemstatement and further apply the engineering knowledge it maps slightly
CO4	PO1 PO12	Slightly	Students can have basic knowledge of the working of the various controls of windows will be helpful to apply this gained knowledge infuture and hence maps slightly
CO5	PO1 P12	Slightly	As the Students are to interpret and helps to recognize the various problems faced in windows and solve complex problems in future it maps slightly.
CO6	PO1 PO12	Slightly	As the Students can apply the various testing methods studied o which would be helpful in future it maps slightly

CO	PSO	Mapping level	Justification
CO1	PSO1 PSO3	Slightly	Graduates will use the solid foundation in the principles of computer science by understanding the concepts of menus, windows and interfaces which would be helpful to adapt these concepts during their career in software industry or while pursuing higher studies.
CO2	PSO1 PSO3	Slightly	Graduates will use the solid foundation in the principles of computer science to comprehend various business functions during their career in softwareindustry or while pursuing higher studies.
CO3	PSO1 PSO3	Slightly	Graduates will use the solid foundation in the principles of computer science to analyze the characteristics and components of windows during theircareer in software industry or while pursuing higher studies.
CO4	PSO1 PSO3	Slightly	Graduates will use the solid foundation in the principles of computer science to develop the capability to demonstrate the various controls ofwindows during their career in software industry or while pursuing higher studies.
CO5	PSO1 PSO3	Slightly	Graduates will use the solid foundation in the principles of computer science Illustrate the concepts of business continuity and disaste recovery in a storage infrastructure during their career in software industry or while pursuing higher studies.
CO6	PSO1 PSO3	Slightly	Graduates will use the solid foundation in the principles of computer science to apply the various testing methods during their career in software industry or while pursuing higher studies.

15CS834 - SYSTEM MODELLING AND SIMULATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Interpret the basic principles, characteristics and models of simulation.	3	2		1									3	1		
CO2	Construct simulation models for realworld problems exploring Event-Scheduling / Time-Advance Algorithms	1	3	2	2	1							2	3	2	1	
CO3	Adapt the concept of queuing theory and evaluate the performanceof various queuing models	3	2	2	3	1					2		2	2	1	1	
CO4	Demonstrate the use of random numbers in simulation systems	3	2	2	3								1	2	1	1	
CO5	Estimate the parameters for testingusing appropriate methods	2	2	1	3						2			2		1	1
CO6	Apply the verification, validation and calibration process to the simulation models.	1			2									1	2	1	

	PO	Level	Justification
CO1	PO1	Maps Highly	Strong knowledge of mathematics and computer science will help the students to build simulation model.
	PO2	maps moderately	Helps the students to identify and build simple simulation models.
	PO4	Maps slightly	Enables the students to interpret basic principle characteristics and models of simulation.
CO2	PO2	Maps Highly	Strong analytical knowledge will enable the students to implement Event-Scheduling / Time-Advance Algorithms
	PO3 PO4 PO12	Maps moderately	Students will be able to examine different event and time scheduling algorithms.
	PO1 PO5	Maps slightly	The basic knowledge of mathematics and computer science will help the students to understand algorithms.
CO3	PO1 PO4	Maps Highly	Strong knowledge of mathematics and analytical skills will help the students to evaluate the performance of variousqueuing models.
	PO2 PO3 PO10 PO12	Maps moderately	The basic knowledge of mathematics and computer science will help the students to identify various queuingmodels.
	PO5	Maps slightly	Will enable the students to understand various queuing models.
CO4	PO1 PO4	Maps Highly	Strong knowledge of mathematics and analytical skills helps the students demonstrate the use of random numbers.
	PO2 PO3	Maps moderately	To enable the students to generate random numbers.
	PO12	Maps slightly	Will lay down basic foundation for random numbers generation
CO5	PO4	Maps Highly	Strong knowledge of predictive algorithms helps the students to Estimate the parameters testing
	PO1 PO2 PO10	maps moderately	The basic knowledge of mathematics and computer science will enable students understand parameter estimation
	PO3	Maps slightly	The basic knowledge of engineering will help the students to understand concept of parameter estimation
CO6	PO4	maps moderately	Students will be able interpret and analyze validation and calibration process
	PO1	Maps slightly	The basic knowledge of computer science will help the students to understand validation and calibration process

	PSO	Level	Justification
CO1	PSO1	maps Highly	Strong knowledge of mathematics and computer science will help the students to build various simulation model.
	PSO2	Maps slightly	Enables the students to interpret basic principle characteristics and models of simulation.which will help the student towork with multi-disciplinary teams
CO2	PSO1	maps Highly	Strong analytical knowledge will enable the students to implement diffwernt Event-Scheduling / Time-Advance Algorithms
	PSO2	maps moderately	Students will be able to examine and compare different event and time scheduling algorithms.
	PSO3	Maps slightly	The basic knowledge of mathematics and computer science will help the students to understand algorithms which will form the basis them to pursue higher studies
CO3	PSO1	Maps moderately	The basic knowledge of mathematics and computer science will help the students to identify various queuing models
	PSO2 PSO3	Maps slightly	Will enable the students to understand various queuing models which will be useful in further studies.
CO4	PSO1	Maps moderately	To enable the students to generate random numbers which will enhance mathematical knowledge
	PSO2 PSO3	Maps slightly	Will lay down basic foundation for random numbers generation to take up further studies.
CO5	PSO1	Maps moderately	Strong knowledge of predictive algorithms helps the students to Estimate the parameters testing which will enhancedomain knowledge
	PSO3 PSO4	maps slightly	The basic knowledge of mathematics and computer science will enable students understand parameter estimation will help in prediction analysis in different environments which will be useful for the society.
CO6	PSO2	maps moderately	Students will be able interpret and analyze validation and calibration process in different desciplines.
	PSO1 PSO3	maps slightly	The basic knowledge of computer science and mathematics will help the students to understand validation and calibration process.

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

INTERNSHIP WORK (15CS84)

	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Gain Knowledge on various technological domains in real time	3	3	2	1	-	-	-	-	1	-	2	-	1	-	2	-
CO2	Learn and develop specific skillset for implementing project.	2	2	2	1	-	-	-	-	-	-	-	-	1	-	2	-
CO3	Organize/plan of project design and develop in specific stipulated time	-	1	1	2	1	-	-	-	2	-	-	1	1	2	2	1
CO4	Prepare the detailed internship project work report	1	1	2	2	1	2	1	-	-	-	-	-	1	1	2	-
CO5	Build a record of work experience from internship work	1	2	-	3	1	-	-	-	1	1	-	1	-	3	3	-
CO6	Search and apply for a job after the course completion	-	-	-	3	2	-	-	-	-	1	1	-	-	3	1	-

	PO	Level	Justification
CO1	PO1 PO2	Maps Substantial(High)	The students can able to Gain Knowledge on various technological domains in real time
	PO3 PO11	Maps Moderate (Medium)	Gain Knowledge on various technological domains in real time on different technological domains slightly hard for the students
	PO4 PO9	Maps Slight(Low)	Research based knowledge and research methods, analysis and interpretation of data and multidisciplinary task are difficult here

CO2	PO1 PO2 PO3	Maps Moderate (Medium)	Student required Learn and develop specific skillset for implementing project
	PO4	Maps Slight(Low)	Student may require strong knowledge on research methods for analysis and implementation after the Learn and develop specific skillset
CO3	PO4 PO9	Maps Moderate (Medium)	Student required knowledge for Organize/plan of project design and develop in specific stipulated time and interdisciplinary actions
	PO2 PO3 PO5 PO12	Maps Slight(Low)	Student may require Organize/plan of project design and develop in specific stipulated time on context of technological change.
CO4	PO3 PO4 PO6	Maps Moderate (Medium)	Designing and implementing of system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules Prepare the detailed internship project work report
	PO1 PO2 PO5 PO7	Maps Slight(Low)	The students required strong mathematical concepts and system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules solve complex problems. The student will have Prepare the detailed internship project work report on their internship work
CO5	PO4	Maps Substantial(High)	The student have research-based knowledge and research methods including build algorithms, code implementation, testing and validation, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
	PO2	Maps Moderate (Medium)	The students can able Build a record of work experience from internship work on build algorithms, code implementation, testing and validation
	PO1 PO5 PO9 PO10 PO12	Maps Slight(Low)	The students have to required strong mathematical knowledge for build a record of work experience from internship work
CO6	PO4	Maps Substantial(High)	The students can able Search and apply for a job after the course completion
	PO5	Maps Moderate (Medium)	The students can able to create project report /documents and apply for a job after the course completion
	PO10 PO11	Maps Slight(Low)	The students have to required to Search and apply for a job after the course completion t is low at the undergraduate level

	PSO	Level	Justification
CO1	PSO1	Maps Moderate (Medium)	The students have moderate Knowledge on various technological domains in real time
	PSO3	Maps Slight (Low)	The graduates have limited Knowledge on various technological domains in real time for the software industry
CO2	PSO1	Maps Moderate (Medium)	The students have moderate knowledge for Learn and develop specific skillset for implementing project.
	PSO3	Maps Slight (Low)	The graduates have limited opportunity in industry just by limited skillset for implementing project.
CO3	PSO1 PSO4	Maps Moderate (Medium)	The students have moderate knowledge on Organize/plan of project design and develop in specific stipulatedtime
	PSO2 PSO3	Maps Slight (Low)	The graduates have limited opportunity in industry by knowing Organize/plan of project design and develop in specific stipulated time
CO4	PSO1 PSO2	Maps Moderate (Medium)	The students have moderate knowledge in Prepare the detailed internship project work report
	PSO3	Maps Slight (Low)	The graduates have limited opportunity in software industry or pursue higher studies by Prepare the detailed internship project work report
CO5	PSO2 PSO3	Maps Substantial (High)	The students will able to Build a record of work experience from internship work to work in IT industries.
CO6	PSO1 PSO2	Maps Substantial (High)	The students are able to Search and apply for a job after the course completion for best business opportunities
	PSO3	Maps Slight (Low)	The graduates have limited job after the course completion to pursue higher studies or in industry

PROJECT WORK PHASE 2 (15CSP85)

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Continuation of project work implementation as suggested by review committee	1	2	-	3	1	-	-	-	1	1	-	1	-	3	3	-
CO2	Monitoring of project by project review committee.	2	2	2	1	-	-	-	-	-	-	-	-	1	-	2	-
CO3	Update different requirements, phasesand functionalities	-	1	1	2	1	-	-	-	2	-	-	1	1	2	2	1
CO4	Design system architecture, DFD, Class diagrams, Sequence diagrams andFlow charts for different modules	1	1	2	2	1	2	1	-	-	-	-	-	1	1	2	-
CO5	Build algorithms, code implementation, testing and validation	1	2	-	3	1	-	-	-	1	1	-	1	-	3	3	-
CO6	Prepare the project work 2 report	-	-	-	3	2	-	-	-	-	1	1	-	-	3	1	-

	PO	Level	Justification
CO1	PO4	Maps Substantial(High)	The student have continue to build algorithms, code implementation, testing and validation, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
	PO2	Maps Moderate(Medium)	The students can able build algorithms, code implementation, testing and validation
	PO1 PO5 PO9 PO10 PO12	Maps Slight(Low)	The students have to required strong mathematical knowledge for build algorithms, code implementation, testing and validation

CO2	PO1 PO2 PO3	Maps Moderate(Medium)	Student will be monitoring of project by project review committee.
	PO4	Maps Slight(Low)	Student may require strong knowledge on research methods for analysis and implementation as suggested by review committee.
CO3	PO4 PO9	Maps Moderate(Medium)	Student required knowledge for formulate different requirements, phases, functionalities and interdisciplinary actions
	PO2 PO3 PO5 PO12	Maps Slight(Low)	Student may require strong knowledge to formulate different requirements, phases, functionalities and interdisciplinary actions based on context of technological change.
CO4	PO3 PO4 PO6	Maps Moderate(Medium)	Designing and implementing of system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules will be complex process... Adopting ethical principles in multidisciplinary environments is tough task
	PO1 PO2 PO5 PO7	Maps Slight(Low)	The students required strong mathematical concepts and system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules solve complex problems. The student will have learn life-long in context of technological change
CO5	PO4	Maps Substantial(High)	The student have research-based knowledge and research methods including build algorithms, code implementation, testing and validation, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
	PO2	Maps Moderate(Medium)	The students can able build algorithms, code implementation, testing and validation
	PO1 PO5 PO9 PO10 PO12	Maps Slight(Low)	The students have to required strong mathematical knowledge for build algorithms, code implementation, testing and validation
CO6	PO4	Maps Substantial(High)	The students can able write project report on research methods including build algorithms, code implementation, testing and validation, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
	PO5	Maps Moderate(Medium)	The students can able to create project report /documents using modern tools and techniques
	PO10	Maps Slight	The students have to required write mathematical concepts in their project report and being able to comprehend and write effective
	PO11	(Low)	reports and design documentation is low at the undergraduate level

CO1	**PSO**	**Level**	**Justification**
	PSO2 PSO3	Maps Substantial (High)	The students will able to design, build algorithms, code implementation, testing and validation ofproject which enable greater opportunities to work in IT industries.
CO2	PSO1	Maps Moderate (Medium)	The students have moderate knowledge on various technological domains and the project reviewcommittee Monitoring on their progress
	PSO3	Maps Slight (Low)	The graduates have limited opportunity in industry just by identifying problem statement and objectives
CO3	PSO1 PSO4	Maps Moderate (Medium)	The students have moderate knowledge on various technological domains to formulate differentrequirements and functionalities of different phases.
	PSO2 PSO3	Maps Slight (Low)	The graduates have limited opportunity in industry by knowing different functionalities and requirements.
CO4	PSO1 PSO2	Maps Moderate (Medium)	The students have moderate knowledge in designing a software system through system architecture,DFD, different modules
	PSO3	Maps Slight (Low)	The graduates have limited opportunity in software industry or pursue higher studies
CO5	PSO2 PSO3	Maps Substantial (High)	The students will able to design, build algorithms, code implementation, testing and validation of project whichenable greater opportunities to work in IT industries.
CO6	PSO1 PSO2	Maps Substantial (High)	The students are able to prepare the best project report by having domain knowledge and effectivecommunication for best business opportunities
	PSO3	Maps Slight (Low)	The graduates have limited opportunity to pursue higher studies

15CS32 -ANALOG & DIGITAL ELECTRONICS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Analyse the performance of FETs, Opamp circuits and their applications.	2	2	2								1	1	2			
CO2	Apply simplification (SOP/POS) techniques to combinational logic circuits/expressions.	3	2	3	2	1						1		2	1	1	
CO3	Analyze and design various data processing circuits .	3	3	2	2							1	1	2	2	1	
CO4	Realize the working of various flip flops and their applications.	2	2	2	2							1	1	2	1	1	
CO5	Interpret and analyze the performance of A/D and D/A converters.	2	1	1									1	1	1	1	
CO6	Implement logic circuits using HDL models	2			1	2							1	1	2		

15CS33 -DATA STRUCTURE AND APPLICATIONS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate and classify various data structures and their primitive operations	2	1										1	2			
CO2	Apply the concepts of arrays and strings in sorting and pattern matching applications	3	3	3	2	1							1	3		1	
CO3	Implement the operations of linear data structures like stacks, queues and linked lists.	3	3	2	2	2							1	3	1	1	
CO4	Demonstrate primitive operations on different types of trees and their applications	3	3	2	2	2							1	3	1	1	
CO5	Summarize the concepts of graphs, traversal techniques, hashing and file handling.	2	2	2	2	3							1	3	1	1	1
CO6	Design and develop solutions approaches to solve various computing problems by choosing appropriate data structures	3	3	3	3	3			1	1			2	2	3	3	1

15CS34 -COMPUTER ORGANIZATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO 4
CO1	Visualize the basic building blocks of computer.	3											2	3		2	
CO2	Analyze the programs as sequence of machineinstructions.	3	2										2	2			
CO3	Explore different ways of communicating with I/O devices and interfaces.	3											2	2			
CO4	Design and evaluate the performance ofmemory systems.	3	2	3	1								1	3	2	1	
CO5	Demonstrate arithmetic and logical operations with integer and floating point operands.	3	3	3	2	1							1	3	2		
CO6	Analyze the basic functional units of processor.	3	2	3	1								1	3	2	2	

15CS35 -UNIX & SHELL PROGRAMMING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Conceptualize the features of UNIX Architecture	1											1	1		1	
CO2	Interpret basic commands for file attribute manipulation.	2											1	1		1	
CO3	Demonstrate functioning of Vi editor and its commands	2				1							2	2		1	
CO4	Illustrate the usage of various UNIX filter commands.	2				1							2	2		1	
CO5	Design programs using shell scripts	1	1	3		1							2	1		2	
CO6	Analyze process life cycle development and demonstrate Perl programs.	1	1	3		2							1	1		2	

15CS36 –DISCRETE MATHEMATICAL STRUCTURES

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify the correctness of propositional logic and trutables.	2	1	1									1	1			
CO2	Make use of counting techniques, mathematica induction, permutations and combinations t solve problems.	2	1	1									1	1			
CO3	Analyze and develop partial orders, relations andfunctions.	2	1	1									1	1			
CO4	Analyze the use of principle of inclusion-exclusion,derangements and recurrence relations	2	1	1									1	1			
CO5	Analyze and develop types of graphs and trees.	2	1	1									1	1			

15CSL37-ADE LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Utilize various electronic devices to design and construct the analog circuits	2	2	1	-	-	-	-	-	-	-	1	-	1	-	-	-
CO2	Use simulation package like multisim to design analog circuits.	-	-	1	-	3	-	-	-	1	-	1	-	1	2	-	-
CO3	Use various digital integrated circuits in the design and demonstration of various combinational logic and data processing circuits	2	1	3	-	-	-	-	-	-	-	1	1	3	-	1	-
CO4	Design and demonstrate various types of sequential circuits using flip flops.	2	-	3	-	-	-	-	-	-	-	1	1	2	-	1	-
CO5	Use simulation package like modelsim to design various digital circuits.	-	-	1	-	3	-	-	-	1	-	1	-	1	2	-	-
CO6	Understand the working and implementation of DAC and ALU	2	1	1	-	-	-	-	-	-	-	1	1	1	-	-	-

15CSL38-DS LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Solve computational problems using basic C language constructs.	3	3	1	1	1				2			3	3	1	3	
CO2	Design and implement operations on both single and Multidimensional arrays.	3	2	3	1	1				1	2		3	3	1	2	
CO3	Develop menu driven programs to demonstrate primitive operations on stacks and queues	3	3	2	1	1				1	2		2	3	1	2	
CO4	Assess the operations on different types of Trees.	3	3	2		1				1	2		2	3	1	3	
CO5	Demonstrate traversal techniques on graphs	2	3	2	1	1				1	2		2	3	1	3	
CO6	Apply appropriate data structures to solve computing problems	3	2	3	2	2	2		1	2	1	2	3	3	1	2	1

15CS42 - Software Engineering

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Assess professional and ethical responsibility, software engineering principles and activities involved inbuilding large software programs.	1					3		3	1	1		2	1	1	2	3
CO2	Demonstrate the process of requirements gathering, classification, specification andvalidation.	1			2	1	2		1	2	2		2	1	2	2	1
CO3	Design models for software system, component and process within realistic constraints.	2	1	3	3	2	1	1	1	2	1	1	2	1	3	2	1
CO4	Apply, design, implement, verify, validate and maintain software systems with metrics	2	2	3	3	1	1	1	1	1	1	1	2	2	2	3	1
CO5	Apply cost estimation and time schedulingfor quality project activities.	3	1	2	3	2	1	2	1	2	1	3	3	2	1	2	2
CO6	Recognize the need for agile software development.	2	1	3	3	2	1	1	2	2	1	1	2		1	3	1

15CS43 -DESIGN & ANALYSIS OF ALGORITHM

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Restate various algorithmic approaches and various problem types	3	1	-	1	-	-	-	-	-	-	-	2	3	1	-	1
CO2	Formulate the analysis frameworks for algorithms	3	3	2	-	-	-	-	-	-	-	-	1	3	3	2	-
CO3	Design, Develop and Analyze the algorithms for problems on searching and sorting	3	3	3	2	1	-	-	-	1	-	-	1	3	3	3	2
CO4	Design and Develop algorithms to solve various problems based on graphs and trees	3	3	3	2	-	-	-	-	2	-	-	1	3	3	3	2
CO5	Compare different classes of problems such as P, NP, NP Complete and NP hard	1	2	2	3	-	-	-	-	2	-	-	1	1	2	2	3
CO6	Design, Develop and Analyze the algorithms for various computational problems	3	3	3	3	-	-	-	1	1	1	1	2	3	3	3	3

15CS44-MP & MC

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	**Illustrate 8086 Architecture and Addressing modes**	1	-	-	-	-	-	-	-	-	-	-	1	3	1	-	-
CO2	Develop x86 assembly language code to solve the problems	3	1	3	-	-	-	-	-	-	-	-	1	2	1	1	-
CO3	Demonstrate interrupt routines	2	-	2	-	-	-	-	-	-	-	-	2	2	1	-	-
CO4	Interface various I/O, memory devices to x86 processor.	2	2	-	1	-	-	-		1	-	-	2	2	1	-	-
CO5	Explore ARM fundamentals and instruction set.	2	-	2	-	2	-	-	-	1	-	2	2	2	1	-	-
CO6	Develop ARM programming skills.	2	1	2	-	2		-		1	-	2	2	2	1	1	1

15CS45-OBJECT ORIENTED CONCEPTS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Understand object oriented programming concepts using C++	2	-	-	-	-	-	-	-	-	-	-	2	3	-	3	-
CO2	Apply fundamental concepts of OOP in JAVA	3	-	1	-		-	-	-	-	-	-	2	3	-	3	-
CO3	Implement JAVA programs using Java JDK environment	2	2	3	-	3	-	-	-	1	-	-	2	3	3	3	-
CO4	Develop multi threaded and event handling programs	1	2	3	2	2	-	-	-	1	-	-	1	3	2	3	-
CO5	Explore usage of JAVA packages and Interfaces	1	-	1	2	3	-	-	-	1	-	-	1	3	2	3	-
CO6	Implement event driven GUI using Applets and Swings	3	2	3	2	3	-	-		1	-	-	1	3	2	2	-

15CS46-DATA COMMUNICATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify various types of computer networks and connecting devices.	2	2	1	1								2	3	1	2	
CO2	Evaluate the data transmission techniques.	3	3	3	2								3	3	1	2	
CO3	Illustrate TCP/IP protocol suite and switching criteria.	2	1	2	2								2	3	2	2	
CO4	Analyze different error checking methods used in Data Link layer.	3	3	2	3	1							1	3	2	3	
CO5	Demonstrate medium access control protocols, wireless and wired LAN architecture.	3	3	2	3								1	3	2	2	
CO6	Differentiate IP versions : IPV4, IPV6 and Mobile IP.	3	3	2	3	1							2	3	2	3	

15CSL47-DAA LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Develop solutions for computing problems using JAVA constructs.	3	2	2	1	1			1	2	2		3	3	1	3	
CO2	Design,implement and Symptotically analyze various algorithms on Sorting.	3	3	3	1	1				2	2		3	3	1	2	
CO3	Design and implement algorithms to solve problems on Graphs.	3	3	3	1	1				2	2		3	3	1	2	
CO4	Design and develop algorithms to solve combinatorial problems.	3	3	3	1	1				2	2		3	3	1	2	
CO5	Choose appropriate algorithmic techniques to solve computational problems.	3	2	3	2	1	1			3	1	1	3	2	1	2	
CO6	Analyze algorithms to deduce their time complexities.	3	3	1	1								2	2		2	

15CSL48- MICROPROCESSOR AND MICROCONTROLLER LABORATORY

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate x86 instruction set and addressing modes	2	1	-	-	-		-	-	-	-	-	1	2		1	2
CO2	Design and implement x86 assembly language programs.	2	-	-	2	2	-	-	-	-	-	-	1	3	1	2	2
CO3	Explore the functioning of hardware devices and its interfacing	2	--	2	-	2	-	-	-	-	-	-	2	2	1	2	2
CO4	Demonstrate ARM instruction set and addressing modes.	2	-	2	1	2	-	-	-	-	-	-	2	2	1	2	2
CO5	Implement ARM assembly and C language programs.	2	1	2		2	-	-	-	-	-	-	2	2	1	2	2
CO6	Implement interfacing of hardware devices to ARM family	2	-	-	-	-	-	-	-	-	-	-	1	2	2	2	2

15CS51-MANAGEMENT ENTREPRENEURSHIP FOR IT INDUSTRY

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Comprehend Management activities	1		1	1		1	1		1		2	2	1	1	1	1
CO2	Emphasize Entrepreneur concepts and outline their importance inentrepreneurship	1	1	1	2		1	1	1	2		2	1	1	1	2	1
CO3	Apply Enterprise Resource Planning (ERP) solutions for ITindustry	3	3	3	3		1	3	1	2		1	1	3	2	3	1
CO4	Propose the methods for establishing micro, small and largescale enterprises	1	2	2	2		1	1	2	1		1	1	1		1	2
CO5	Apply IPRs and institutionalsupport for entrepreneurship	1	1	2	1		1	3	3	1	2	1	2	2		1	2
CO6	Prepare project report for IT industry based on feasibility studies	3	3	3	3		3	3	2	3	3	1	3	3		3	1

15CS52-COMPUTER NETWORKS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate the principles of application layer protocols.	3	2	1			1	1					2	3	1	2	
CO2	Distinguish transport layer services and protocols.	3	3	2	2	3	1	1					2	3	1	2	
CO3	Classify IP and Routing Algorithms in network layer.	3	3	2	3	3	1	1					2	3	2	2	
CO4	Characterize the Wireless and Mobile Networks covering IEEE 802.11 Standard.	2	1		2	3	1	1					3	2	1	3	
CO5	Demonstrate streaming and working of Distribution servers.	1			1		1	1					1	1	1	2	
CO6	Exemplify Network support for multimedia.				1		1						1			1	

15CS53-DATABASE MANAGEMENT SYSTEM

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Represent database with different data modeling concepts.	2	-	2	-	-	-	-	-	1	-	-	1	3	1	1	-
CO2	Design simple database systems.	3	2	3	2	-	-	1	-	1	-	-	2	2	1	1	-
CO3	Use Structured Query Language (SQL) for building and manipulating database.	2	1	1	1	3	-	-	-	2	-	-	3	3	3	3	-
CO4	Develop application to interact with databases.	1	-	3	1	3	-	1	1	2	-	-	2	2	3	2	1
CO5	Analyze and apply normalization for better database design.	2	2	2	2	-	-	-	-	-	-	-	2	2	1	2	-
CO6	Demonstrate the use of concurrency control and transaction processing.	1	-	1	2	2	-	1	1	1	-	-	2	2	2	2	1

15CS54-AUTOMATA THEORY & COMPUTABILITY

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Acquire fundamental understanding of the core concepts in Automata theory and Theory of Computation	3	3	3	2								2	3	1		
CO2	Translate between different models of Computation	2	3	3	2								2	2	2		
CO3	Design Grammars and Automata for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.	2	2	2	2			1					1	2	2	2	
CO4	Apply rigorously formal mathematical methods to prove properties of languages, grammars and Automata	2	2	2	2			1					1	2	2	2	
CO5	Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness.	2	1	1	3								2			2	
CO6	Classify a problem with respect to different models of Computation	2	1	1	1								2			2	

15CS553-ADVANCED JAVA AND J2EE

	Course Outcomes	Program Outcomes											Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Interpret enumerations and collections in advanced Java.	1				2							2	2		2	
CO2	Build programs using collection framework.	1	1	2		2							2	2	1	2	
CO3	Illustrate and develop String Handling methods in JAVA.	2	1	2		2							2	2		2	
CO4	Apply Servlets to develop web applications.	3	2	2	2	2				1		1	2	2	1	2	
CO5	Demonstrate database access using JDBC API.	3	2	2	1	2	1		1	1		1	2	2	1	2	1
CO6	Design reusable software components using JSP.	2	2	3	1	2	1			1		1	2	1	1	2	

15CS562-ARTIFICIAL INTELLIGENCE

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify the AI based problems	3	1	1	1									2	2	1	
CO2	Determine the technique to solve theAI problems	2	2	2	2									2	2	2	
CO3	Investigate various learning techniques	2	2	2	2									1		1	
CO4	Analyze expert systems	2	2		1	1								1	2	2	1
CO5	Explore different stages in NaturalLanguage processing	2	1		1									2	2	2	
CO6	Implement appropriate learning algorithms	2	2	2	1	1								2		2	

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
COMPUTER NETWORKING LAB (15CSL57)

10C S72	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate error detection technique using CRC	2	3	1	2						2	1	2	2	1	1	
CO2	Analyze and compare different routing protocols	2	2	1	2						2	1	2	2	1	1	
CO3	Implement connection-oriented and connection-less protocols in the network	2	2	1							2	1	2	2	1	1	
CO4	Demonstrate security features in networks using RSA algorithm	2	2	1	2				1		2	1	2	2	1	1	1
CO5	Analyze techniques to avoid congestion in the network	2	2	1	2						2	1	2	1	1	1	1
CO6	Implement, analyze and evaluate networking protocols using NS3 Tool	2	1			2					1		1	1	1		

15CSL58-DBMS WITH MINI PROJECT LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate DDL commands on Database.	1	-	1	-	-	-	-	-	-	-	-	-	1	-	1	
CO2	Create ER diagrams and conceptualschema for the problems given.	2	1	2	1	-	-	-	-	-	-	1	-	2	2	2	
CO3	Apply Integrity constraints on relations.	2	2	2	1	-	-	-	-	-	-	1	-	2	2	2	
CO4	Demonstrate Update operations.	1	-	1	-	-	-	-	-		-	-	1	1	-	1	
CO5	Demonstrate more complex SQLqueries.	1	1	1	-	-	-	-	-	-	-	-	1	2	1	2	
CO6	Implement, analyze and evaluatethe project developed application..	-	2	2	1	-	1	1	-	1	-	2	-	1	-	1	

15CS61-CNSCL

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Apply the basics of number theory invarious cryptographic techniques and summarize its applications	3	3		1								2	3	2	2	
CO2	Design and develop simple cryptography algorithms for real world situation.	3	3	3	2	2	2		1				2	3	2	2	1
CO3	Analyze various authentication andkey agreement protocols.	1	2	1	2	1	1		1				2	2	2	2	1
CO4	Realize the security threats caused bymalware, design Firewall based solutions and access control techniques to solve societal security problems.	1	3	3	2	2	2		1				2	2	2	2	1
CO5	Investigate the need of security at different levels/layers and its services.	1	2	2	1	1	1		1				2	1	2	2	1
CO6	Understand cyber security and illustrate the need of cyber Law.	1	2		1		3		2				3		1	2	2

15CS62-COMPUTER GRAPHICS & VISUALIZATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Design and implement algorithms for 2D graphics primitives and attributes.	2	1	2	1	2							1	2	2	2	
CO2	Illustrate geometric transformations on both 2D and 3D objects.	2	2	2	1	3				1			2	2	2	2	
CO3	Apply concepts of clipping and visible surface detection in 2D and 3D viewing, and illumination models.	2	3	3	2	3							2	2	2	2	
CO4	Decide suitable hardware and software for developing graphics applications using OpenGL.		1	1	1	3			1	1			1		2	3	
CO5	Explore different representation of Programming event driven input.			2	1	2				1			2	1		3	
CO6	Demonstrate and analyze the concepts of curve surfaces.	2	3	2	3	2				1			2	2		2	

15CS63 - SYSTEM SOFTWARE AND COMPILER DESIGN

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Interpret the concepts of assemblers and macroprocessors	2	-	-	-	-	-	-	-	-	-	-	1	1	-	1	-
CO2	Illustrate the functions, features and design options of loader	1	-	-	-	2	-	-	-	-	-	-	1	1	-	1	-
CO3	Classify the phases of compiler and build lexical analyzers	3	2	2	1	2	-	-	-	-	-	-	1	2	1	1	-
CO4	Design parsers for compilers	3	1	1	1	2	-	-	-	-	-	-	2	2	2	1	-
CO5	Construct SyntaxDirected Translation and generate intermediatecode	2	1	-	1	2	-	-	-	-	-	-	1	2	-	1	-
CO6	Generate ASM code fora given intermediate code	3	1	1	1	-	-	-	-	-	-	-	2	1	-	2	-

15CS64-OPERATING SYSTEMS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify the functionalities of OS and their categories	3	-	1	-	-	-	-	-	-	-	-	2	3	-	1	-
CO2	Evaluate multithread techniques and process scheduling algorithms	2	3	3	2	-	1	1	-	-	-	-	3	2	3	2	-
CO3	Demonstrate suitable techniques for resource management	3	3	3	2	-	1	1	-	-	-	-	2	3	3	1	-
CO4	Evaluate file system allocation and memory management techniques	3	3	3	2	-	1	1	-	-	-	-	2	3	2	2	-
CO5	Review the protection mechanisms in processing environment	-	-	-	-	-	1	-	1	-	-	-	1	1	2	1	1
CO6	Explore the case studies on Operating Systems	-	1	-	-	-	-	-	-	-	2	-	1	-	-	1	1

15CS651-DATA MINING AND DATAWAREHOUSING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO 4
CO1	Identify data mining problems and implement thedata warehouse	-	-	-	-	-	-	-	-	-	-	-	2	2	2	-	-
CO2	Define multi-dimensional data models	2	2	-	-	3	-	-	-	-	-	-	2	-	2	2	-
CO3	Categorize types of data and preprocessingtechniques.	1	1	-	1	-	-	-	-	-	-	-	2	1	-	-	-
CO4	Evaluate Association algorithms and itsapplications.	1	2	1	2	1	2	-	-	-	-	-	2	1	2	2	-
CO5	Apply various Classification techniques anddifferent types of classifiers	-	2	1	-	3	2	-	-	2	1	-	2	-	2	2	-
CO6	Analyze and adapt existing clustering techniquesin various applications.	-	2	1	2	3	2	-	-	2	1	-	2	-	-	-	-

15CS653-OPERATIONS RESEARCH

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO 2	PSO3	PSO4
CO1	Understand how to translate a real-world problem, into a mathematical formulation	3	3	1										3	2		
CO2	Identify and apply optimization techniques forvarious problems	2	2	2	2									2	2	2	
CO3	Model the given problem as transportationproblem and solve.	2	2	2										2	2		
CO4	Apply game theory for decision support system	2	2	2	1									2	2	2	
CO5	Analyze and apply branch-and-bound and heuristic methods to solve general integerproblems	2	2	2	2									2	2	2	
CO6	Incorporate the principles of assignment of jobsand find the optimal solution	2	2	2										2	2		

15CS664-PYTHON APPLICATION PROGRAMMING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Examine python syntax and semantics and be fluent in using flow control and functions	1	2			3							1	2	2	3	
CO2	Demonstrate proficiency in handling strings and file systems in python	1	2	2	2	3							1	1	3	2	
CO3	Create and run python programs using core data structures like lists, dictionaries , tuples, and sets and use of Res	2	2	3	2	3							2	1	3	2	
CO4	Interpret and apply the concepts of OOP	2	1	3	-	3						3	2	1	3	2	
CO5	Implement exemplary applications related to network programming and web services	2	2	3	2	3						3	2	1	3	2	
CO6	Implement database applications in python	2	2	3	2	3						3	2	1	3	2	

15CSL67-SS & OS LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Implement and demonstrateLexer's and Parser's.	3	1	3	2	3	-	-	-	-	-	-	1	-	-	1	-
CO2	Design and implement variousparsing techniques.	3	3	3	2	3	-	-	-	-	-	1	1	2	1	2	-
CO3	Design and implement a codegenerator	3	3	3	2	1	-	-	-	-	-	1	1	3	1	3	-
CO4	Evaluate different process scheduling algorithms in operatingSystem.	3	2	3	2	1	-	-	-	-	-	-	1	2	1	1	-
CO5	Design and implement a solution for deadlocks in operating system	3	2	3	2	1	-	-	-	-	-	-	1	1	1	1	-
CO6	Evaluate different algorithms required for management of page allocation techniques	3	2	3	2	1	-	-	-	-	-	-	1	1	1	2	-

15CSL68-CG WITH MINI PROJECTLAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Apply the concepts of computer graphics.	2	1	2	-	2	-	-	-	-	-	-	2	2	1	1	-
CO2	Implement computer graphics applications using OpenGL.	2	2	3	2	2	-	-	-	-	-	-	2	2	2	1	-
CO3	Animate real world scenarios using OpenGL	2	2	3	2	2	1	1	-	3	3	2	2	2	2	2	-
CO4	Rasterize 2D primitives using OpenGL	2	3	2	1	2	-	-	-	-	-	-	2	2	2	1	-
CO5	Implement different clippingalgorithms.	2	2	2	1	2	-	-	-	-	-	-	2	3	2	1	-
CO6	Transform 2D and 3D geometricobjects.	3	3	2	1	2	-	-	-	2	-	-	2	2	2	1	

15CS71- Web Technology and its Applications

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO 4
CO1	Adapt HTML and CSS syntax and semantics to build web pages.	2	-	2	-	2	-	-	-	1	-	1	2	2	2	3	-
CO2	Construct and visually format tables and forms using HTML and CSS	2	-	2	-	2	-	-	-	1	-	1	2	2	2	2	-
CO3	Develop Client-Side Scripts using JavaScript	2	2	3	1	3	-	-	-	2	1	2	3	3	3	3	-
CO4	Develop Server-Side Scripts using PHP	2	1	2	1	3		-	-	2	1	2	3	3	3	3	-
CO5	Appraise the principles of object oriented development using PHP	2	1	3	1	3	-	-	-	2	2	2	3	3	2	3	2
CO6	Inspect JavaScript frameworks jQuery and Backbone	2	1	3	1	3	-	-	-	3	2	2	3	3	3	3	-

15CS72-ADVANCED COMPUTER ARCHITECTURE

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Understand the concepts of parallel computing	2	-	-	-	-	-	-	-	-	-	-	1	2	-	1	-
CO2	Demonstrate the concepts of hardware technologies	2	-	-	-	-	-	-	-	-	-	-	1	2	-	1	-
CO3	Explore bus, cache, shared memory with pipelining and super scalar techniques	2	1	-	-	-	-	-	-	-	-	-	1	2	-	1	-
CO4	Classify parallel architecture	2	1	1	-	-	-	-	-	-	-	-	1	2	-	1	-
CO5	Assess Scalable architecture	2	1	1	-	-	-	-	-	-	-	-	1	2	-	1	-
CO6	Investigate parallel programming concept	2	1	1	-	-	-	-	-	-	-	-	1	2	-	1	-

15CS73-Machine Learning

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Understand machine learning and problems relevant to machine learning	2	1	1									1	2		2	2
CO2	Analyze concept learning and decision trees.	2	2	1	1	1				1			2	2	1	2	2
CO3	Apply artificial neural networks inmachine learning.	2	2	1	2	1				1			2	2	1	2	2
CO4	Interpret and realize Bayesian methods	2	2	1	2	1				1			2	2	1	2	2
CO5	Investigate instance based learning	2	2	1	2	1				1			2	2	1	2	2
CO6	Evaluate hypothesis and examinereinforcement learning. .	2	2	1	2	1				1			2	2	1	2	2

15CS741-NATURAL LANGUAGE PROCESSING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Understand the challenges and applications of NLP.	1		2										1		1	
CO2	Illustrate semantics and pragmatics of language for NLP.	2	2	2	2								1	2			2
CO3	Analyze the natural language text at word level and semantic level.	2	3	2	2								1	2			
CO4	Establish dependency path and annotate knowledge role.	2	3	2										2			1
CO5	Demonstrate techniques and tools used in Text mining.	2	2	2	2	1							2	1	2	1	
CO6	Explore various information retrieval techniques.	2	2	2	1								2	2		1	

15CS744-UNIX SYSTEM PROGRAMMING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Distinguish among ANSI C & POSIX standards	2		1	1								2	1		2	-
CO2	Illustrate UNIX Kernel support for files	1		1	2	1							2	1		2	
CO3	Understand Kernel support for process	1		2	1								2	2		2	
CO4	Interpret Process Accounting, process UID ,Terminal logins, network logins	1		2	1								2	2		2	
CO5	Analyze process control, Deamon characteristics, coding rules and error logging	1		1	1	1							1	2		1	
CO6	To build an application/service over a UNIX system	1		1	1	1				1		1	3	2	3	2	1

15CS754 -SAN

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Examine the Storage Area Networks characteristics, components and storage architectures	1											1	1		1	1
CO2	Exemplify the concept of RAID and their suitability for different application environments	1	2	1	1								1	1		1	1
CO3	Analyze file sharing operations on NAS and IP-SAN of the different networks	1	1										1	1		1	1
CO4	Depict the working of Storage Virtualization on Various levels of Storage	1											1	1		1	1
CO5	Illustrate the concepts of business continuity and disaster recovery in a storage infrastructure	1											1	1		1	1
CO6	Demonstrate the Knowledge of Securingthe local replication in Storage Infrastructure and Cloud	1											1	1		1	1

15CSL76-Machine Learning Laboratory

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Implement and demonstrate the concept learning algorithms (FIND-S, Candidate-Elimination)	2	2	2									2	2	1	2	
CO2	Demonstrate the working of the decision tree and apply this knowledge to classify a new sample (ID3)	2	2	2		1							2	2	1	2	
CO3	Build an Artificial Neural Network by implementing the Back propagation algorithm.	2	2	2		1							2	2	1	2	
CO4	Apply the naïve Bayesian classification methods and build Bayesian network.	2	2	2	2	1							2	2	1	2	
CO5	Implement EM algorithm, k-means and Compare their results.	2	2	2	2	1							2	2	1	2	
CO6	Investigate instance based and regression algorithms.	2	2	2		1							2	2	1	2	

15CSL77 -WEB TECHNOLOGY & ITS APPLICATIONS LA B

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Develop web pages using HTML5 and CSS.	2											1	2		1	2
CO2	Design dynamic web pages using JavaScript	2	1	2		1				1		1	2	2		1	2
CO3	Create interactive web applications using PHP.	2	2	2	1	2				1		1	2	2		2	1
CO4	Explore different Web Services, Internet Tools and Database	2	1	2	1	2				1	1	1	2	2	1	2	2
CO5	Design and Develop Web project	2	1	2		2				1	2	1	2	2	1	2	2
CO6	Evaluate and Document Web project	2	1	2		3					2		2	1	1	2	2

PROJECT WORK PHASE 1 (15CSP78)

	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Survey on various technological domains	3	3	2	1	-	-	-	-	1	-	2	-	1	-	2	-
CO2	Identify problem statement and objectives	2	2	2	1	-	-	-	-	-	-	-	-	1	-	2	-
CO3	Formulate different requirements, phases and functionalities	-	1	1	2	1	-	-	-	2	-	-	1	1	2	2	1
CO4	Design system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules	1	1	2	2	1	2	1	-	-	-	-	-	1	1	2	-
CO5	Build algorithms, code implementation, testing and validation	1	2	-	3	1	-	-	-	1	1	-	1	-	3	3	-
CO6	Prepare the project report	-	-	-	3	2	-	-	-	-	1	1	-	-	3	1	-

15CS81-INTERNET OF THINGS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Interpret the impact and challenges posed by IoT networks leading to new architectural models.	1	0	0	0	0	0	2	0	0	0	0	1	1	0	1	0
CO2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.	2	0	0	0	0	0	2	0	0	0	0	2	1	0	1	0
CO3	Appraise the role of IoT protocols for efficient network communication.	2	0	0	0	1	0	2	0	0	0	0	2	2	0	1	0
CO4	Elaborate the need for Data Analytics and Security in IoT.	2	0	0	0	1	0	2	0	0	0	0	2	2	0	1	0
CO5	Illustrate different sensor technologies for sensing real world entities	1	1	3	0	1	0	2	0	0	0	0	3	1	0	2	0
CO6	Explore the applications of IoT in Industry	1	1	3	0	2	0	2	0	0	0	0	3	1	0	2	0

15CS82- Big Data Analytics

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Master the concepts of HDFS and MapReduceframework	2	1	1	2	1							1	1	1	1	
CO2	Investigate Hadoop related tools for Big Data Analytics and perform basic Hadoop Administration	1	2	2	2	1							1	1	1	2	
CO3	Recognize the role of Business Intelligence, Data warehousing and Visualization in decision making	1	1	1	1	1							1	1	1	2	
CO4	Infer the importance of core data miningtechniques for data analytics	1	2	1	2	1							1	1	2	1	
CO5	Compare and Analyze different contrast differentText Mining Techniques	1	1	1	2	1							1	1	2	1	
CO6	Explore the applications of Social Networkingand Web mining Techniques	1	2	2	2	1							1	1	1	1	

15CS832-UID

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	To understand the concepts of menus, windows and interfaces	1											1	1		1	
CO2	To comprehend various business functions	1	2	1	1								1	1		1	
CO3	To analyze the characteristics and components of windows	1	1										1	1		1	
CO4	To demonstrate the various controls of windows	1											1	1		1	
CO5	To study the various problems in windows with respect to color textand graphics	1											1	1		1	
CO6	To apply the various testing methods	1											1	1		1	

15CS834 - SYSTEM MODELLING AND SIMULATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Interpret the basic principles, characteristics and models of simulation.	3	2		1									3	1		
CO2	Construct simulation models for realworld problems exploring Event-Scheduling / Time-Advance Algorithms	1	3	2	2	1							2	3	2	1	
CO3	Adapt the concept of queuing theory and evaluate the performanceof various queuing models	3	2	2	3	1					2		2	2	1	1	
CO4	Demonstrate the use of random numbers in simulation systems	3	2	2	3								1	2	1	1	
CO5	Estimate the parameters for testingusing appropriate methods	2	2	1	3						2			2		1	1
CO6	Apply the verification, validation and calibration process to the simulation models.	1			2									1	2	1	

INTERNSHIP WORK (15CS84)

	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Gain Knowledge on various technological domains in real time	3	3	2	1	-	-	-	-	1	-	2	-	1	-	2	-
CO2	Learn and develop specific skillset for implementing project.	2	2	2	1	-	-	-	-	-	-	-	-	1	-	2	-
CO3	Organize/plan of project design and develop in specific stipulated time	-	1	1	2	1	-	-	-	2	-	-	1	1	2	2	1
CO4	Prepare the detailed internship project work report	1	1	2	2	1	2	1	-	-	-	-	-	1	1	2	-
CO5	Build a record of work experience from internship work	1	2	-	3	1	-	-	-	1	1	-	1	-	3	3	-
CO6	Search and apply for a job after the course completion	-	-	-	3	2	-	-	-	-	1	1	-	-	3	1	-

PROJECT WORK PHASE 2 (15CSP85)

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Continuation of project work implementation as suggested by review committee	1	2	-	3	1	-	-	-	1	1	-	1	-	3	3	-
CO2	Monitoring of project by project review committee.	2	2	2	1	-	-	-	-	-	-	-	-	1	-	2	-
CO3	Update different requirements, phasesand functionalities	-	1	1	2	1	-	-	-	2	-	-	1	1	2	2	1
CO4	Design system architecture, DFD, Class diagrams, Sequence diagrams andFlow charts for different modules	1	1	2	2	1	2	1	-	-	-	-	-	1	1	2	-
CO5	Build algorithms, code implementation, testing and validation	1	2	-	3	1	-	-	-	1	1	-	1	-	3	3	-
CO6	Prepare the project work 2 report	-	-	-	3	2	-	-	-	-	1	1	-	-	3	1	-

17MAT31

	Program Outcomes											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	3	1	2	2	2	1	1	2	2	3
CO2	3	3	3	2	2	2	2	1	1	2	2	3
CO3	3	3	3	1	1	1	1	1	1	1	1	3
CO4	3	3	3	2	2	2	2	1	2	2	2	3
CO5	3	3	3	2	2	2	2	1	2	2	2	3

COs	**POs**	**CRL**	**Justification**
CO1	PO1, PO2 PO3	3	Fourier series to analyse the circuits and system communication also to know the periodic signals
	PO5,PO6 PO7	2	Its a tool to solve PDE in many professional engineering practice.
	PO4	1	Fourier series had a deep influence in the further development of mathematics and mathematical physics
	PO8	1	Fourier series will commit to ethical principles and responsibilities

	PO10, PO11	2	Write up for complex engineering problems will be given
	PO12	3	It is mathematical field which needs lot of research
	P09	1	Team work needed to provide students hands on experience utilizing fourier techniques
CO2	PO1, PO2 PO3	3	Fourier transform and Z Transforms are the basic tools for solving complex engineering problems
	PO5, PO6 PO7	2	FT and ZT can afford mathematical devices through which solutions of numerous boundary value problems of
	PO4	2	Knowledge in can be used to develop an efficient system
	PO8	1	FT and ZT will commit to ethical principles and responsibilities
	PO10, PO11	2	Write up for complex engineering problems will be given
	PO12	3	It is mathematical field which needs lot of research
	PO9	1	Team work needed to provide students hands on experience utilizing fourier techniques
CO3	PO1, PO2 PO3, PO4	3	Numerical method use to solve algebraic and transcendental equation also simultaneous and non liner equati iterative method for the solution of eigen value problem.
	PO4	1	An ability to conduct investigations of complex problems by methods that include appropriate experiments, interpretation of data, and synthesis of information in order to reach validconclusions
	PO5, PO6 PO7, PO9 PO10, PO11	1	Numerical techniques have become indispensible tool in the hand s of engineers. There are lots of methods ca more accurate
	PO8	1	Mathematical modelling will commit to ethical principles and responsibilities
	PO12	3	It is a mathematical field which needs lot of research
CO4	PO1, PO2 PO3, PO4	3	Apply greens ,divergence and stokes theorem in various application in engineering field particularly elector gravitational fields and fluid flow problems
	PO5, PO6 PO7	2	Tool to convert line to surface integrals, surface to volume integrals.
	PO8	1	Mathematical modelling will commit to ethical principles and responsibilities

	PO9 PO10, PO11	2	Write up for complex engineering probl
	PO12	3	It is mathematical field which needs lot of research
CO5	PO1 PO2 PO3	3	To solve the problems in dynamics of rigid bodies, optimization of orbits and vibration problems. And also fi minimum value of the definite integral involving certain functions.
	PO4, PO5 PO6, PO7	2	Finding maximum and minimum value of the definite integral involving certain functions.
	PO9, PO10 PO11	2	Understand the concepts of mathematics and apply it to their work as a member or leader in a team to man
	PO8	1	Mathematical modelling will commit to ethical principles and responsibilities
	PO12	3	The students will become aware of the need for life long learning and the continued upgrading of technical k of numerical calculus
CO6	PO1, PO2, PO3	3	Z Transforms are the basic tools for solving complex engineering problems
	PO4, PO5 PO6, PO7	2	ZT can afford mathematical devices through which solutions of numerous boundary value problems of engin
	PO9, PO10 PO11	2	Write up for complex engineering problems will be given
	PO12	3	It is mathematical field which needs lot of research

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS32 -ANALOG & DIGITAL ELECTRONICS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Analyse the performance of FETs, Opamp circuits and their applications.	2	2	2	-	-	-	-	-	-	-	1	1	2	-	-	-
CO2	Apply simplification (SOP/POS) techniques to combinational logic circuits/expressions.	3	2	3	2	1	-	-	-	-	-	1	-	2	1	1	-
CO3	Analyze and design various data processing circuits .	3	3	2	2	-	-	-	-	-	-	1	1	2	2	1	-
CO4	Realize the working of various flip flops and their applications.	2	2	2	2	-	-	-	-	-	-	1	1	2	1	1	-
CO5	Interpret and analyze the performance of A/D and D/A converters.	2	1	1	-	-	-	-	-	-	-	-	1	1	1	1	-
CO6	Implement logic circuits using HDL models	2	-	-	1	2	-	-	-	-	-	-	1	1	2	-	-

CO1	PO	Level	**Justification**
	PO1PO2 PO3	Maps moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to moderately understand the working of FETs and Opamp circuit to analyse their performance. Also provide design solution for the given specification for certain applications.
	PO11 PO12	Maps slightly	Students can manage to do projects using opamps in multidisciplinary environment to a slighter extent and provides scope for career development leading to lifelong learning.
CO2	PO1PO3	Maps substantially	The knowledge of mathematical principles and basics of science will help the students to apply the same to substantially understand the simplification techniques pertaining to combinational logic and will be able to design logic circuits for the given SOP POS function.
	PO2,PO4	Maps moderately	Student will be able to apply first principles of mathematics and science to moderately analyse and verify the combinational logic problems.
	PO5 PO11	Maps slightly	Students can use modern tools to simulate combinational logic circuits and manage to do projects using combinational logic in multidisciplinary environment to a slighter extent.
CO3	PO1PO2	Maps substantially	The knowledge of mathematical principles and basics of science will help the students to apply the same to substantially analyze certain data processing circuits
	PO3PO4	Maps moderately	Student will be able to apply first principles of mathematics and science to design few data processing circuits to a moderate extent and also can verify certain design problems pertaining to few data processing circuits.
	PO11 PO12	Maps slightly	Students can manage to do projects using data processing circuits in multidisciplinary environment to a slighter extent and get scope for career development leading to lifelong learning.
CO4	PO1PO2 PO3PO4	Maps moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to moderately understand and verify the working of various flip flops, analyze their functionality in certain applications like registers and counters and will be able to design sequential circuits for the given specification to a moderate extent.
	PO11 PO12	Maps slightly	Students can manage to do projects using sequential logic circuits in multidisciplinary environment to a slighter extent and get scope for career development leading to lifelong learning.
CO5	PO1	Maps moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to moderately analyze the performance of certain A/D and D/A converters.
	PO2 PO3 PO12	Maps slightly	Student will be able to apply first principles of mathematics and science to analyze the working of certain A/D and D/A converters and also design few A/D converters to do projects in multidisciplinary environment to a slighter extent.
CO6	PO1PO5	Maps moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to moderately understand the various HDL models and implement certain logic circuits using VHDL/Verilog HDL aided by modern simulation tools like xilinx.
	PO4 PO12	Maps slightly	Student will be able to verify certain HDL models for few problems pertaining to digital circuits and get scope for career development leading to lifelong learning.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS33 -DATA STRUCTURE AND APPLICATIONS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate and classify various data structures and their primitive operations	2	1										1	2			
CO2	Apply the concepts of arrays and strings in sorting and pattern matching applications	3	3	3	2	1							1	3		1	
CO3	Implement the operations of linear data structures like stacks, queues and linked lists.	3	3	2	2	2							1	3	1	1	
CO4	Demonstrate primitive operations on different types of trees and their applications	3	3	2	2	2							1	3	1	1	
CO5	Summarize the concepts of graphs, traversal techniques, hashing and file handling.	2	2	2	2	3							1	3	1	1	1
CO6	Design and develop solutions approaches to solve various computing problems by choosing appropriate data structures	3	3	3	3	3			1	1			2	2	3	3	1

	PO	Level	Justification
CO1	PO1	Moderately	The knowledge of mathematical principles and basics of computer science will help the students to classify various data structures and their primitive operations.
	PO2	Slightly	
	PO12	Slightly	The knowledge of research and natural science does not contribute the stated CO Data Structures is part of any programming based applications.

CO2	PO1	Substantially	Knowledge of fundamental maths is essential for pattern matching ans sorting techniques.
	PO2	Substantially	Sorting techniques needs analysis schemes which in turn needs maths background
	PO3	Substantially	Pattern matching and sorting is an integral part of any complex engineering problem
	PO4	Moderately	The concepts of sorting and pattern matching moderately makes use of research methods.
	PO5	Slightly	Primitive editing and debugging tools are used.
	PO12	Slightly	Pattern matching and sorting is an integral part of any engineering problem
CO3	PO1	Substantially	Understanding of stacks, queues , linked lists is key to solution of many engineering problems
	PO2	Substantially	Concepts of stacks, queues and linked lists are important
	PO3	Moderately	Design solutions for complex programming applications contain basics of Stacks, queues and linked lists.
	PO4	Moderately	Analysis, interpretation of data and design of experiments requires extensive knowledge of linked lists.
	PO5	Moderately	Primitive editing and debugging tools are used.
	PO12	Slightly	Any computer based applications require the concepts of stacks, queues and linked list
CO4	PO1	Substantially	The knowledge of mathematical principles helps in understanding the basic structure of trees.
	PO2	Substantially	Primitive operations of trees such as insertion, deletion, traversals are very essential in solving engineering
	PO3	Moderately	problems. Tree operations are integral part of any complex engineering problem
	PO4	Moderately	Research oriented projects require the data to be represented in tree format
	PO5	Moderately	Practising project's solution makes use of modelling based on trees.
	PO12	Slightly	Concept of trees is found to be used in diverse areas of engineering and technology.
CO5	PO1	Moderately	Mathematical knowledge helps in performing traversals on graphs and random access on files .
	PO2	Moderately	Basic Hashing operations are used in solving several engineering problems.
	PO3	Moderately	Applications concerned with cultural, societal and environmental considerations makes use of file and hashing
	PO4	Moderately	operations. Effective searching techniques can be implemented using hashing and effective storage using files.
	PO5	Slightly	Practising project's solution makes use of modelling based on graphs and hashing concepts
	PO12	Slightly	Graph based applications are relevant to broader category of applications

CO1	**PSO**	**Level**	**Justification**
	PSO1	Moderately	Various data structures and their primitive operations are crucial in Computer Science based projects

CO2	PSO1 PSO3	Substantialy Slightly	Sorting and pattern classification makes extensive usage of Maths The concepts of sorting and pattern matching are integral part of most of computer based projects and courses.
CO3	PSO1 PSO2 PSO3	Substantially Slightly Slightly	Understanding of stacks, queues , linked lists is key to solution of many engineering problems Concepts of stacks, queues and linked lists are vital in post graduate courses/projects
CO4	PSO1 PSO2 PSO3	Substantially Slightly Slightly	The knowledge of mathematical principles helps in understanding the basic structure of trees. Primitive operations of trees such as insertion, deletion, traversals are very essential in solving engineering problems. Tree operations are integral part of career of a computer science graduate .
CO5	PSO1 PSO2 PSO3 PSO4	Substantially Slightly Slightly Slightly	Mathematical knowledge helps in performing traversals on graphs and random access on files . Graph traversals and hashing needs the knowledge of different subjects like maths, graph theory and algorithmic techniques. Graph based applications are relevant to broader category of applications
CO6	PSO1 PSO2 PSO3 PSO4	Moderately Substantially Substantially Slightly	Knowledge of mathematics and engineering fundamentals are extensively used in designing appropriate data structures to solve engineering problems. Choosing appropriate data structure and designing IT systems needs the exposure to modern tool usage. Data structures is the core stream of computer science and is widely used in most of the computer science based projects Ethicsand integrity in designing/programming must be inculcated in engineering practice.

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS34 -COMPUTER ORGANIZATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Visualize the basic building blocks of computer.	3											2	3		2	
CO2	Analyze the programs as sequence of machine instructions.	3	2										2	2			
CO3	Explore different ways of communicating with I/O devices and interfaces.	3											2	2			
CO4	Design and evaluate the performance of memory systems.	3	2	3	1								1	3	2	1	
CO5	Demonstrate arithmetic and logical operations with integer and floating point operands.	3	3	3	2	1							1	3	2		
CO6	Analyze the basic functional units of processor.	3	2	3	1								1	3	2	2	

CO1	PO	Level	Justification
	PO1	maps substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and analyse its performance .
	PO12	Maps moderately	Performance analysis helps the students to gain the research based knowledge and life-long learning.
CO2	PO1	Maps substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and to generate the basic assembly language code.
	PO2 PO12	Maps moderately	Students are able to encode the machine instructions and its memory requirement and to apply the same in life long learning.

CO3	PO1	Maps substantially	The knowledge of basics of computer science will help the students to understand the communication between processor and I/O devices.
	PO12	Maps moderately	Students are able to analyze the bus structure and its applications.
CO4	PO1 PO3	Maps substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and to exploit cache performance and also enables students to design memory of different organizations.
	PO2	Maps moderately	Performance of processor is analyzed theoretically using various cache coherence protocols and replacement algorithms.
	PO4,PO12	Maps slightly	Students will learn how to improve the cache miss and cache miss penalty and to apply the same in life long learning.
CO5	PO1, PO2 PO3	Maps substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and to increase the performance of processor using carry save adder, fast multiplication.
	PO4	Maps moderately	Students are able to analyze the problems on Booth's algorithm by increasing the number of bits.
	PO5,PO12	Maps slightly	Students are able to solve the problems using simulators.
CO6	PO1,PO3	maps substantially	The knowledge of basics of computer science will help the students to understand the working of processor and the generation of control signals..
	PO2	Maps moderately	Students are able to analyse the microroutine.
	PO4, PO12	Maps slightly	Students gain knowledge on microcontrollers.

CO	PSO	LEVEL	Justification
CO1	PSO1	Maps substantially	Students will get solid foundation in the principles and practices of computer science, including mathematics, science and basic engineering.
	PS03	Maps moderately	After gaining the knowledge in fundamentals, students will be prepared for their careers in the software industry or pursue higher studies and continue to develop their professional knowledge.
CO2	PSO1	Maps moderately	Students are able to write assembly language programs
CO3	PSO1	Maps moderately	Students are able to understand how I/O devices communicate within the system.
CO4	PSO1	maps substantially	Students are able to analyze the memory system.
	PSO2	Maps moderately	Students are able to analyze flip flops, inverters and also virtual memory organization
	PSO3	Maps slightly	After learning memory systems, students can continue to excel their career in hardware .
CO5	PSO1	maps substantially	The graduates will have solid foundation in the principles and practices of computer science, including mathematics, science and basic engineering.
	PSO2	Maps moderately	Will get skills to work on arithmetic operations.
CO6	PSO1	maps substantially	The knowledge of basics of computer science will help the students to understand the working of processor and the generation of control signals..
	PSO2	Maps moderately	Students are able to analyse the microroutine using microprogrammed control unit..
	PSO3	Maps moderately	Analyze the working of microcontrollers.

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS35 -UNIX & SHELL PROGRAMMING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Conceptualize the features of UNIX Architecture	1											1	1		1	
CO2	Interpret basic commands for file attribute manipulation.	2											1	1		1	
CO3	Demonstrate functioning of Vi editor and its commands	2				1							2	2		1	
CO4	Illustrate the usage of various UNIX filter commands.	2				1							2	2		1	
CO5	Design programs using shell scripts	1	1	3		1							2	1		2	
CO6	Analyze process life cycle development and demonstrate Perl programs.	1	1	3		2							1	1		2	

	PO	Level	Justification
CO1	PO1 PO12	maps slightly	Basic mathematical principles will help the students to understand the concepts of OS easily and to Understand and involve in life-long learning for knowledge enhancement.
CO2	PO1	Maps moderately	The knowledge of mathematical will help the students to understand the concepts easily and solve various problems.
	PO12	Maps slightly	Students identify, analyze and formulate solutions using existing C compiler and debugging tools .
CO3	PO1 PO12	Maps moderately	The knowledge of mathematics and basics of editors will help the students to understand the working of editors and there in involve in lifelong learning of designing of editors.
	PO5		The knowledge of editors for modeling of engineering activities with an understanding of the limitations
CO4	PO1 PO12	Maps moderately	Basics of mathematics principles and basics commands of unix will help the student to enhance knowledge about working of commands and there in involve himself in life long learning process.
	PO5	Maps slightly	Apply the knowledge of filters for prediction and modeling to engineering activities with an understanding of the limitations.
CO5	PO1 PO2 PO5	maps slightly	The knowledge of mathematical principles and basics of unix helps to analyze problems and to reach substantiated conclusions.
	PO3 PO12	Maps moderately	The knowledge of shell scripting will help to design solutions for engineering problems and that meet the specified needs and therein helps students to involve for lifelong learning activity.
CO6	PO1 PO2 PO12	maps slightly	The knowledge of mathematical principles and perl will help students to identify, analyze and formulate solutions using knowledge of perl programming and there involve in lifelong knowledge enhancement.
	PO3 PO5	Maps moderately.	The knowledge of perl programming will help to apply appropriate techniques, resources, for prediction and modeling to engineering activities with an understanding of the limitations.

	PSO	Level	Justification
CO1	PSO1 PSO3	Maps slightly	The knowledge of unix architecture will help students to have solid foundation about OS which will help in there career in software industry.
CO2	PSO1 PSO3	Maps slightly	Information about commands and its working will help the students to per sue career in the industry
CO3	PSO1	Maps Moderately	The working knowledge of various editors will give a basic idea that is required in the programming
	PSO3	Maps Slightly	Exposure to various editors will help in programming and debugging skills of students.
CO4	PSO1	Maps Moderately	Working of filters will provide idea about data extraction and filtering
	PSO3	Maps Slightly	Will help students to get motivated with handling data and develop a career in industry
CO5	PSO1	Maps Slightly	Shell exposure will provide the knowledge about unix OS and its interpretation of commands
	PSO3	Maps Moderately	Will provide complete knowledge about scripting to develop a career
CO6	PSO1	Maps Slightly	Process its life cycle will give knowledge about internal working of OS
	PSO3	Maps Moderately	Perl programming knowledge will help students to per sue is career in industry.

17CS36 –DISCRETE MATHEMATICAL STRUCTURES

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify the correctness of propositional logand truth tables.	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO2	Make use of counting techniques, mathematical induction, permutations and combinations to solve problems.	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO3	Analyze and develop partial orders, relationsand functions.	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO4	Analyze the use of principle of inclusion- exclusion, derangements and recurrence relations	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO5	Analyze and develop types of graphs andtrees.	2	1	1	-	-	-	-	-	-	-	-	1	1			

COs	POs	CRL	Justification
CO1	PO1	2	Along with the knowledge of mathematics, the concept of discrete mathematical structures is used for different applications of engineering.
	PO2	1	Discrete mathematical structures are used to identify, formulate and design a mathematical model for many engineering problems.
	PO3	1	The acquired mathematical knowledge is used for design of engineering problems.
	PO12	1	Knowledge of discrete structures is used for application of any chosen area in engineering disciplines for generating a mathematical model.
CO2	PO1	2	Study of logical connectives in discrete structure help in providing the solutions to engineering problems.
	PO2	1	By using with concept of logical connectives different problems are analyzed.
	PO3	1	The correctness of the analysis of the problem is better understood by the logical connectives.
	PO12	1	Knowledge of mathematics is used for application of any chosen area in engineering disciplines for generating a mathematical model.
CO3	PO1	2	The concept of relations and functions are applied to find solutions for some engineering problems.
	PO2	1	The theory of partial order is used to analyze the solutions pertaining to the problems.
	PO3	1	knowledge of Hasse diagram is used to design engineering problems.
	PO12	1	Knowledge of mathematical structures is used for application of any chosen area in engineering disciplines for generating a mathematical model.
CO4	PO1	2	Knowledge of discrete structures like rook polynomials is used in solving domain specific problems.
	PO2	1	Knowledge of discrete structures like recurrence relations is used analyze engineering problems.
	PO3	1	knowledge of derangements is used to design engineering problems.
CO5	PO12	1	Knowledge of the principle of inclusion-exclusion is used for application of chosen area in engineering disciplines for generating a mathematical model.
	PO1	2	The knowledge of group theory is used in various engineering problems.
	PO2	1	The theory of Error detection and error correction codes is used in analysis of engineering problems.

	PO3	1	The concept of group theory to design the solutions for engineering problems.
	PO12	1	Knowledge of trees is used for application of any chosen area in engineering disciplines for generating a mathematical model.

COs	**POs**	**CRLs**	**Justification**
CO1	PSO1	1	The concept of Fundamentals of logic is applied for solving engineering problems.
CO2	PSO1	1	Analysis of problems using combinatorics is done by adapting software development methodology.
CO3	PSO1	1	Concept of relations and functions followed to solve an engineering problem.
CO4	PSO1	1	Specific counting techniques and recurrence relations are used to solve complex engineering problems.
CO5	PSO1	1	The method of Discrete structures such as Graph theory and combinatorics used to understand domain specific initiatives.

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CSL37-ADE LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Utilize various electronic devices to design and construct the analog circuits	2	2	1	-	-	-	-	-	-	-	1	-	1	-	-	-
CO2	Use simulation package like multisimto design analog circuits.	-	-	1	-	3	-	-	-	1	-	1	-	1	2	-	-
CO3	Use various digital integrated circuits inthe design and demonstration of various combinational logic and data processing circuits	2	1	3	-	-	-	-	-	-	-	1	1	3	-	1	-
CO4	Design and demonstrate various types of sequential circuits using flip flops.	2	-	3	-	-	-	-	-	-	-	1	1	2	-	1	-
CO5	Use simulation package like modelsim to design various digital circuits.	-	-	1	-	3	-	-	-	1	-	1	-	1	2	-	-
CO6	Understand the working and implementation of DAC and ALU	2	1	1	-	-	-	-	-	-	-	1	1	1	-	-	-

CO1	**PO**	**Level**	**Justification**
	PO1, PO2	Maps moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to implementfew analog circuits and analyze their functionality at a moderate level.
	PO3, PO11	Maps slightly	Student will be able to design few analog circuits and do projects in multidisciplinary environment to a slighter extent.
CO2	PO5	Maps substantially	Students will be able to use modern simulation tool like multisim to substantially analyze the working of analog circuits by simulation.
	PO3,PO9 PO11	Maps slightly	Student will be able to use simulation tools to design few analog circuits and do projects individually or in multidisciplinary environment to a slighter extent.
CO3	PO3	Maps substantially	Student will be able to substantially design and implement various combinational logic circuits using digital ICs.
	PO1	Maps moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to understandthe functioning of various combinational logic circuits at a moderate level.
	PO2, PO11 PO12	Maps slightly	Student will be able to apply first principles of mathematics and science to analyze the working of certain combinational logic circuits and can manage to do projects using combinational logic in multidisciplinary environment to a slighter extent and get scope for career development leading to lifelong learning.
CO4	PO3	Maps substantially	Student will be able to substantially design and implement few sequential logic circuits using digital ICs.
	PO1	Maps moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to understandthe functioning of certain sequential logic circuits at a moderate level.
	PO11,PO12	Maps slightly	Student will be able to do projects using sequential logic in multidisciplinary environment to a slighter extent and getscope for career development leading to lifelong learning.
CO5	PO5	Maps substantially	Students will be able to use modern simulation tool like xilinx to substantially analyze the working of various digitalcircuits by simulation.
	PO3, PO9 PO11	Maps slightly	Student will be able to use simulation tools to design few digital circuits and do projects individually or in multidisciplinary environment to a slighter extent.
CO6	PO1	Maps moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to understandthe functioning of few D/A converters and ALU at a moderate level.
	PO2, PO3 PO11, PO12	Maps slightly	Student will be able to apply first principles of mathematics and science to analyze certain D/A converter and ALUand can manage to do projects using D/A converters in multidisciplinary environment to a slighter extent and get scope for career development leading to lifelong learning.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CSL38-DS LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Solve computational problems using basic C language constructs.	3	3	1	1	1	-	-	-	2	-	-	3	3	1	3	-
CO2	Design and implement operations on both single and Multidimensional arrays.	3	2	3	1	1	-	-	-	1	2	-	3	3	1	2	-
CO3	Develop menu driven programs to demonstrate primitive operations on stacks and queues	3	3	2	1	1	-	-	-	1	2	-	2	3	1	2	-
CO4	Assess the operations on different types of Trees.	3	3	2	-	1	-	-	-	1	2	-	2	3	1	3	-
CO5	Demonstrate traversal techniques on graphs	2	3	2	1	1	-	-	-	1	2	-	2	3	1	3	-
CO6	Apply appropriate data structures to solve computing problems	3	2	3	2	2	2	-	1	2	1	2	3	3	1	2	1

	PO	Level	Justification
CO1	PO1, PO2, PO12	maps substantially	Knowledge of fundamental maths is essential for computational problems. Sorting techniques needs analysis schemes which in turn needs mathsbackground
	PO9	Maps moderately	Team work plays vital role while carrying out projects using primitive and non primitive data types.
	PO3, PO4, PO5,	Maps slightly	Pattern matching and sorting is an integral part of any complex engineering problem The concepts of sorting and pattern matching moderately makes use of research methods. Primitive editing and debugging tools are used.
CO2	PO1, PO3, PO12	Maps substantially	The knowledge of mathematical principles and basics of computer science will help the students to gain knowledge on arrays and its operations.
	PO2, PO10	Maps moderately	Array concepts are very essential in solving engineering problems.
	PO4, PO5, PO9	Maps slightly	Applications concerned with cultural, societal and environmental considerations makes use of array and its operation concept.
CO3	PO1,PO2, PO3, PO10 PO12 PO4, PO5, PO9	Maps substantially	Understanding of stacks, queues , linked lists is key to solution of many engineering problems.Concepts of stacks, queues and linked lists are important in analyzing various problems.
		Maps moderately	Design solutions for complex programming applications contain basics of Stacks, queues and linked lists. Any computer based applications require the concepts of stacks, queues and linked list
		Maps slightly	Analysis, interpretation of data and design of experiments requires extensive knowledge of linked lists. Primitive editing and debugging tools are used. Team work plays vital role while carrying out projects
CO4	PO1,PO2,	Maps substantially	The knowledge of mathematical principles helps in understanding the basic structure of trees. Primitive operations of trees such as insertion, deletion, traversals are very essential in solving engineering problems.
	PO3, PO10 PO12	Maps moderately	Tree operations are integral part of any complex engineering problem Concept of trees is found to be used in diverse areas of engineering and technology.
	PO5,PO9	Maps slightly	Practising project's solution makes use of modelling based on trees.Team work plays vital role while carrying out projects
CO5	PO2 PO1, PO3, PO10 PO12 PO4, PO5, PO9	Maps substantially	Basic Hashing operations are used in solving several engineering problems.
		Maps moderately	Mathematical knowledge helps in performing traversals on graphs and random access on files . Applications concerned with cultural, societal and environmental considerations makes use of file and hashing operations. Graph based applications are relevant to broader category of applications
		Maps slightly	Effective searching techniques can be implemented using hashing and effective storage using files. Practising project's solution makes use of modelling based on graphs and hashing concepts Team work plays vital role while carrying out projects
CO6	PO1, PO3, PO12	maps substantially	Knowledge of mathematics and engineering fundamentals are extensively used in designing appropriate data structures to solve engineering problems. Choosing appropriate data structure is essential while designing health based and safety projects

			Most of computer science based projects would need the extensive usage of various data structure
	PO2, PO4, PO5, PO6, PO9, PO11	Maps moderately	Designing solution approach using proper data structures makes extensive use of maths and research literature. Data structures is primary component in solving research based problems. Usage of modern IT tools helps in understanding the working of complex data structures. Team work plays vital role while carrying out projects using heterogeneous data structures Team work plays vital role while carrying out projects manage projects in multidisciplinary environments
	PO8, PO10	Maps slightly	Ethics in programming must be inculcated in engineering practice. Documentation is maintained.

CO	**PSO**	**Level**	**Justification**
CO1	PSO1, PSO3	Maps substantially	Various data structures and their primitive operations are crucial in Computer Science based projectsPattern matching and sorting is an integral part of any complex engineering problem
	PS02	Maps slightly	Sorting techniques needs analysis schemes which in turn needs maths background
CO2	PSO1	Maps substantially	Sorting and pattern classification makes extensive usage of Maths
	PSO3	Maps moderately	The concepts of sorting and pattern matching are integral part of most of computer based projects and courses.
	PSO2	Maps slightly	
CO3	PSO1	Maps substantially	Understanding of stacks, queues , linked lists is key to solution of many engineering problems
	PSO3	Maps moderately	Concepts of stacks, queues and linked lists are vital in post graduate courses/projects
	PSO2	Maps slightly	Concepts of stacks, queues and linked lists are important in analyzing various problems.
CO4	PSO1, PSO3	maps substantially	The knowledge of mathematical principles helps in understanding the basic structure of trees. Tree operations are integral part of career of a computer science graduate .
	PSO2	Maps slightly	Primitive operations of trees such as insertion, deletion, traversals are very essential in solving engineeringproblems.
CO5	PSO1, PSO3	maps moderately	Mathematical knowledge helps in performing traversals on graphs and random access on files . Applications concerned with cultural, societal and environmental considerations makes use of file and hashingoperations.
	PSO2	Maps slightly	Graph traversals and hashing needs the knowledge of different subjects like maths, graph theory and algorithmictechniques. Graph based applications are relevant to broader category of applications
CO6	PSO1	Maps substantially	Knowledge of mathematics and engineering fundamentals are extensively used in designing appropriate datastructures to solve engineering problems.
	PSO3	Maps moderately	Data structures is the core stream of computer science and is widely used in most of the computer science based projects
	PSO2, PSO4	Maps slightly	Choosing appropriate data structure and designing IT systems needs the exposure to modern tool usage.Ethics and integrity in designing/programming must be inculcated in engineering practice.

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17MAT41

	Program Outcomes											
Co/po	P01	P02	P03	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	1		1		1	1		3
CO2	3	3	3	2	1		1		1	1		3
CO3	3	3	3	2	1		1		1	1	2	3
CO4	3	3	3	2	1		1		1	1	2	3
CO5	3	3	3	2	1		1		1	1	2	3
CO6												

	PO	Level	Justification
CO1	PO1	3	Apply the knowledge Numerical methods to get solutions approximatelty for complex problems
	PO2	3	Apply the knowledge of Calculus in complex engineering problems
	PO3	3	Moderatly applied in development of solutions
	PO4	2	Used in research-based works
	PO5	1	Used to create programs to solve the complex problems
	PO7	1	understand the professional engineering solutions in environmental context
	PO9	1	the complex engineering problems allows students to effectively participate to work in teams

	PO10	1	used in writing reports effectively in a systematic manner
	PO12	3	To engage in independent in the broadest context in technological changes.
CO2	PO1	3	Apply the knowledge of Bessel's DE in Electrical engineering
	PO2	3	Apply the knowledge of Calculus in complex engineering problems
	PO3	3	Moderatly applied in development of solutions
	PO4	2	Used in research based works
	PO5	1	Used to create programs to solve the complex problems
	PO7	1	understand the professional engineering solutions in environmental context
	PO9	1	the complex engineering problems allows students to effectively participate to work in teams
	PO10	1	used in writing reports effectively in a systematic manner
	PO12	3	To engage in independent in the broadest context in technological changes.
CO3	PO1	3	Apply the knowledge of poles, singularities in Fluid Mechanics
	PO2	3	Apply the knowledge of Calculus in complex engineering problems
	PO3	3	Seldomly used in development of solutions
	PO4	2	complex anaylsis is extensively used in flow problems that arises in fluid mechanics
	PO5	1	Complex problems can solved by using moderns tool softwares
	PO7	1	study the professional engineering solutions in research area
	PO9	1	the complex engineering problems allows students to effectively participate to work inteams
	PO10	1	Strongly used in writing reports effectively in a systematic manner
	PO11	2	Partially applied
	PO12	3	Recognize and preparation and abillity in learning lifelong processes
CO4	PO1	3	Apply the knowledge of probability theory in real life problems to predict the future
	PO2	3	helps students to analyse the problem effectively in engineering.
	PO3	3	Seldomly used in development of solutions
	PO4	2	used in real world problems
	PO5	1	Apply the recent techniques in complex engineering activities
	PO7	1	study the professional engineering solutions in research area
	PO9	1	the complex engineering problems allows students to effectively participate to work inteams
	PO10	1	Strongly used in writing reports effectively in a systematic manner
	PO11	2	Strongly applied
	PO12	3	Highly applied to engage in independent in the broadest context in technological changes.
	PO1	3	Apply the knowledge of sampling theory for testing the hypothesis to accept or reject the given data
	PO2	3	Apply the knowledge of sampling theory for testing the hypothesis to accept or reject the given data

CO5	PO3	3	Apply the knowledge of sampling theory for testing the hypothesis to accept or reject the given data
	PO4	2	Students can apply statistical method to solve complex engineering problem and mathematical modelling
	PO5	1	Students can apply statistical method to solve complex engineering problem and mathematical modelling
	PO7	1	Students can apply statistical method to solve complex engineering problem and mathematical modelling
	PO9	1	the complex engineering problems allows students to effectively participate to work in teams
	PO10	1	Understand the concepts of mathematics and apply it to their work as a member or leader in a team to manage the projects
	PO11	2	Understand the concepts of mathematics and apply it to their work as a member or leader in a team to manage the projects
	PO12	3	The students will become aware of the need for life long learnibg and the continuedupgrading of technical knowledge in application of numerical calculus

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS42-OBJECT ORIENTED CONCEPTS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Understand object oriented programming concepts using C++	2	-	-	-	-	-	-	-	-	-	-	2	3	-	3	-
CO2	Apply fundamental concepts of OOP in JAVA	3	-	1	-		-	-	-	-	-	-	2	3	-	3	-
CO3	Implement JAVA programs using Java JDK environment	2	2	3	-	3	-	-	-	1	-	-	2	3	3	3	-
CO4	Develop multi threaded and event handling programs	1	2	3	2	2	-	-	-	1	-	-	1	3	2	3	-
CO5	Explore usage of JAVA Packages andInterfaces	1	-	1	2	3	-	-	-	1	_	_	1	3	2	3	_
CO6	Implement event driven GUI using Applets and Swings	3	2	3	2	3	-	-		1	-	-	1	3	2	2	-

CO1	PO	Level	Justification
	PO1, PO12	maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply performance parameters related to instruction level . Understand the recent developments and life-long learning.
CO2	PO1 PO3	Maps substantially Maps slightly	The knowledge of basics of computer science will help the students to apply the OOP concepts. Students can develop solutions using Java and C++

	PO12	Maps moderately	Ability to engage in independent and life-long learning in the broadest context of technological change.
CO3	PO1 PO2 PO3 PO5 PO9 PO12	Maps moderately Maps moderately Maps substantially Maps substantially Maps slightly Maps moderately	The knowledge of basics of computer science will help the students to apply the same and exploit Java IDE usage. Helps students to identify, formulate solutions using principles of mathematics and engineering sciences through programming. Students design solutions for complex real world problems and design system components or processes that meet the specified needs with appropriate consideration Students create, select, and apply appropriate techniques, resources, and modern IT tools like Eclipse IDE/NetBeans/Blue J etc. Students can do project as an individual/team Engage in independent and life-long learning in the broadest context of technological change.
CO4	PO1 PO2 PO3 PO4 PO5 PO9 PO12	Maps slightly Maps moderately Maps substantially Maps moderately Maps moderately Maps slightly Maps slightly	The knowledge of mathematical principles and basics of computer science will help the students identify basic system performance parameters related to thread level. Help students to explore and find solutions to problems related to thread creation and execution using principles of mathematics. Design solutions for complex engineering problems and execute programs that meet the specified needs with appropriate consideration for the real world. Relative mapping from design level to implementation level Understanding execution of threads using modern tools like Eclipse. Using Eclipse environment modules of complex projects are developed and integrated.Muti-core Architectures require parallel processing via threads
CO5	PO1 PO3 PO4 PO5 PO9 PO12	Maps slightly Maps slightly Maps moderately Maps substantially Maps slightly Maps slightly	Programming specializations like interfaces and packages are understood in basic manner Application oriented programs use packages and interfaces Analysis of problem,Interpretation of data are done effectively using Eclipse IDE NetBeans,Eclipse IDE are used extensively in software development life cycle.Effective functioning in Team work Life long usage of packages and interfaces

CO6	PO1	Maps substantially	Understanding the fundamentals of event handling.
	PO2	Maps moderately	Understanding event handling mechanisms in extensive manner
	PO3	maps substantially	Developing GUI based applications.
	PO4	Maps moderately	Investigate problems related to event handling and multi threading.
	PO5	maps substantially	Eclipse IDE usage in understanding event handling.
	PO9	Maps slightly	Client Server applications require extensive usage of event handling mechanisms
	PO12	Maps slightly	Project front end development requires event handling

	PSO	**Level**	**Justification**
CO1	PSO1	Maps substantially	System level programs requires extensive knowledge of C++languageSoftware
	PSO3	Maps substantially	Industry requires fundamental C++programmingknowledge
CO2	PSO1	Maps substantially	System level and Application level programs requires extensive knowledge of Java languageSoftware
	PSO3	Maps substantially	Industry requires fundamental Java programming knowledge
CO3	PSO1	Maps substantially	Pillars of OOP are required in effective usage of Java Language.Modern tool
	PSO2	Maps substantially	usage like Eclipse
	PSO3	Maps substantially	Java Programming skill is basic requirement for Computer Professionals
CO4	PSO1	Maps substantially	Usage of threads to solve problems which are performance oriented in Real world
	PSO2	Maps moderately	Multi threading and event handling used in interdisciplinary project developmentTo
	PSO3	Maps substantially	develop GUI applications effectively using event handling
CO5	PSO1	Maps substantially	Exploring built in Java Packages and create own packages,interfaces for project developmentJava
	PSO2	Maps moderately	built in Packages and interfaces are used to develop multi disciplinary projects.
	PSO3	Maps substantially	Professional knowledge improved by knowing basic built in packages available in Java for program development
CO6	PSO1	Maps substantially	Project front end development requires extensive usage of event handling using Java SwingsModern
	PSO2	Maps moderately	tools like Eclipse/NetBeans used for program development.
	PSO3	Maps substantially	Helps students to develop career in software industry as front end developer

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS43 -DESIGN & ANALYSIS OF ALGORITHM

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Restate various algorithmic approaches and various problem types	3	1	-	1	-	-	-	-	-	-	-	2	3	1	-	1
CO2	Formulate the analysis frameworks for algorithms	3	3	2	-	-	-	-	-	-	-	-	1	3	3	2	-
CO3	Design, Develop and Analyze the algorithms for problems on searching and sorting	3	3	3	2	1	-	-	-	1	-	-	1	3	3	3	2
CO4	Design and Develop algorithms to solve various problems based on graphs and trees	3	3	3	2	-	-	-	-	2	-	-	1	3	3	3	2
CO5	Compare different classes of problems such as P, NP, NP Complete and NP hard	1	2	2	3	-	-	-	-	2	-	-	1	1	2	2	3
CO6	Design, Develop and Analyze the algorithms for various computational problems	3	3	3	3	-	-	-	1	1	1	1	2	3	3	3	3

	PO	Level	Justification
CO1	PO1	Maps Moderately	Fundamental algorithms are the key constituents in solving complex engineering
	PO2	Maps Slightly	Problems Analysis of the algorithms are not covered; basic algorithms are taught.
	PO4	Maps Slightly	Introduction to various problem types are covered.
	PO12	Maps Moderately	The knowledge of various algorithmic approaches are essential for computer professionals for long time .

CO2	PO1	Substantially	Knowledge of math is very essential in devising analysis framework for algorithms Choosing
	PO2	Substantially	an efficient formulation and analysis framework needs basic math
	PO3	Maps Moderately	Design of algorithms to solve complex problems moderately contributes in meeting the specific needs
	PO12	Maps Slightly	Formulating the analysis framework is the part of any computer based projects.
CO3	PO1	Substantially	Knowledge of math and science are essential in designing sorting/searching algorithms Choosing a
	PO2	Substantially	particular sorting/searching algorithm for a specific task needs analysis and research
	PO3	Substantially Maps	Solution to complex engineering problems will have searching/sorting as their basic components in most cases To
	PO4	ModeratelyMaps	analyze and interpret the data sorting/searching contributes moderately.
	PO5	Slightly Maps	To implement and analyze the searching/sorting algorithms modern IT tools may be used. Multidisciplinary team
	PO9	Slightly Maps	would help in design and development of soring/searching algorithms.Sorting/Searching is primitive operation in
	PO12	Slightly	any computer science based projects .
CO4	PO1	Substantially	Concepts of Graphs and tree heavily rely on theory of math.
	PO2	Substantially Maps	Graph traversals and shortest path algorithms contribute a lot in solving complex engineering problems. Spanning
	PO3	ModeratelyMaps	tree algorithms are employed in designing system components.
	PO4	ModeratelyMaps	Graph traversals, Huffman trees help in deriving valid conclusions.
	PO9	Moderately	Writing efficient algorithm for graphs, trees needs notion from different streams of science and technology. With the
	PO12	Maps Slightly	emerging technological trends concept of graphs, trees have evolved and sustained.
CO5	PO1	Maps Slightly	Comparing different problem types needs knowledge of basic math
	PO2	Maps Moderately	To understand and analyze the problem types (clique, Hamiltonian cycle etc. knowledge of engineering science and math is essential
	PO3	Maps Moderately	Approximate solutions for combinatorial problems help to sollve complex engineering problems. Research
	PO4	Substantially Maps	based knowledge is essential to understand and interpret NP complete and NP hard problems.NP complete and
	PO9	ModeratelyMaps	NP hard problems have a broad scope of multidisciplinary problems.
	PO12	Slightly	Since deterministic algorithms doesn't still exist for combinatorial problems, they slightly map the requirements.
CO6	PO1	Substantially	Concepts of math and science are essential in solving computational problems.
	PO2	Substantially	First principles of math and literature is needed to write efficient algorithms to solve complex problems Problems
	PO3	Substantially	related to public health, environmental issues need efficient algorithms to be written
	PO4	Substantially Maps	Research based knowledge is crucial in designing and analyzing algorithms to solve computational problems. Professional
	PO8	Slightly Maps	ethics are need of the hour while designing algorithms to solve problems
	PO9	Slightly Maps	Designing algorithms needs input from multi -disciplinary streams
	PO10	Slightly Maps	Documenting the design and development of algorithms is essential while building projects

	PO11	Slightly Maps	Management and engineering principles are required in solving / writing algorithms Algorithmic
	PO12	Moderately	skills are integral part of the career of an engineer

	PSO	**Level**	**Justification**
CO1	PSO1	Substantially	Various algorithmic approaches make use of principles of math, science and computer science and engineering. Modern
	PSO2	Maps Slightly	tools might be used to design and develop algorithms.
	PSO4	Maps Slightly	Writing efficient algorithms needs ethics and integrity.
CO2	PSO1	Substantially	Principles of math and computer science is constantly used in formulating algorithms. Multidisciplinary
	PSO2	Substantially	teams and modern tools are very essential in designing and analyzing algorithms.
	PSO3	Maps Slightly	The notion of formulation and analysis of algorithms help the graduates in their career and higher studies.
CO3	PSO1	Substantially	Writing algorithms to solve problems on searching and sorting needs knowledge of math and computer science To
	PSO2	Substantially	write and analyze sorting/searching algorithms modern tools may be used.
	PSO3	Substantially	Since sorting /searching operations are primitives in computer science stream, it is very relevant for the career.Writing
	PSO4	Maps Slightly	an algorithm to solve real time problems needs ethics and integrity.
CO4	PSO1	Substantially	Graduate will have sound knowledge in graphs and trees with the help of fundamental math. Graphs and
	PSO2	Substantially	trees are multidisciplinary subjects and algorithms can be devised using modern tools.
	PSO3	Substantially	Most of the applications makes use of graphs and trees, and hence these concepts are needed throughout the careerEthics
	PSO4	Maps Slightly	and integrity is needed in writing any algorithm
CO5	PSO1	Maps Slightly	Combinatorial problems are hard to solve using deterministic algorithms.
	PSO2	Maps Moderately	Modern tools may be used to obtain approximation algorithms/solution to NP complete problems.
	PSO3	Maps Moderately	Since there are many challenges with respect to combinatorial problems, the graduate's higher studies career may be more
	PSO4	Substantially	challenging Ethics and integrity is needed in writing any algorithm
CO6	PSO1	Substantially	Knowledge of math and computer science is extensively used in devising algorithms
	PSO2	Substantially	Notions from different subjects are essential in designing and analyzing an algorithm
	PSO3	Substantially	Designing algorithm is every day challenge to a computer professional/student
	PSO4	Substantially	Ethics and integrity in designing/programming must be inculcated in engineering practice.

17CS44-Microprocessors & Microcontrollers

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO 4
CO1	**Illustrate 8086 Architecture and Addressing modes**	1	-	-	-	-	-	-	-	-	-	-	1	3	1	-	-
CO2	Develop x86 assembly language code to solve the problems	3	1	3	-	-	-	-	-	-	-	-	1	2	1	1	-
CO3	Demonstrate interrupt routines	2	-	2	-	-	-	-	-	-	-	-	2	2	1	-	-
CO4	Interface various I/O, memory devices to x86 processor.	2	2	-	1	-	-	-		1	-	-	2	2	1	-	-
CO5	Explore ARM fundamentals and instruction set.	2	-	2	-	2	-	-	-	1	-	2	2	2	1	-	-
CO6	Develop ARM programming skills.	2	1	2	-	2		-		1	-	2	2	2	1	1	1

CO1	**PO**	**Level**	**Justification**
	PO1	Maps slightly	Acquire knowledge of basic 8086 architecture and organization of Microprocessor.
	PO12	Maps slightly	Understand the Fundamentals of Microprocessors
CO2	PO1 PO3	Maps moderately	Acquire the knowledge of 8086 Instructions.
	PO2 PO12	Maps Strongly	Design solutions to problems using Instructions, macros, procedures using 8086 programming.
CO3	PO1 PO3 PO12	Maps moderately	Interrupt service routines are used demonstrated with practical considerations.
CO4	PO4 PO9	Maps slightly	Examine the input and output device considerations.
	PO1 PO2 PO12	Maps moderately	Develop Interface solutions for I/O devices efficiently and apply efficient techniques to communicate with X86 devices.
CO5	PO9	Maps slightly	Understand evolution and fundamentals of microcontrollers.
	PO1 PO3 PO5 PO11 PO12	Maps moderately	Acquire knowledge of basic Arm architecture and organization of microcontroller.
CO6	PO2 PO9	Maps slightly	Analyze and design programs to solve real-time problems
	PO1 PO3 PO5 PO11 PO12	Maps Strongly	Analyze the problem using efficient coding techniques through machine instructions and Design solutions to problems using macros, procedures using Arm programming

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS45 - Software Engineering

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Assess professional and ethical responsibility, software engineering principles and activities involved in building large software programs.	1					3		3	1	1		2	1	1	2	3
CO2	Demonstrate the process of requirements gathering, classification, specification and validation.	1			2	1	2		1	2	2		2	1	2	2	1
CO3	Design models for software system, component and process within realistic constraints.	2	1	3	3	2	1	1	1	2	1	1	2	1	3	2	1
CO4	Apply, design, implement, verify, validate and maintain software systems with metrics.	2	2	3	3	1	1	1	1	1	1	1	2	2	2	3	1
CO5	Apply cost estimation and time scheduling for quality project activities.	3	1	2	3	2	1	2	1	2	1	3	3	2	1	2	2
CO6	Recognize the need for agile software development.	2	1	3	3	2	1	1	2	2	1	1	2		1	3	1

CO1	**PO**	**Level**	**Justification**
	PO1 PO9 PO10	Maps Slightly	The knowledge of Software engineering fundamentals, will help the students to solve of complex engineering problems, function effectively as an individual, and as a member or leader in diverse teams and communicate effectively on complex engineering activities with the engineering community and with society at large.
	PO12	Maps Moderately	Understand the recent developments and life-long learning.
	PO6 PO8	Maps Strongly	Commit to professional ethics and responsibilities
CO2	PO1 PO5 PO8	Maps Slightly	The knowledge of basics of computer science, modern engineering and IT tools, ethical principles will help the students to apply the same and gather requirements
	PO4 P06 P09 PO10 P012	Maps Moderately	Analyze complex engineering problems, apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues in requirements gathering, classification, specification and validation, ability to engage in independent and life-long leaning in the broadest context of technological change and ethically function effectively as an individual, and as a member or leader in diverse teams.
CO3	PO2 PO6 PO7 P08 PO10 PO11	Maps Slightly	Ethically analyze, apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, communicate effectively on complex engineering activities in Design models for sustainable development of software system and Understand project management.
	PO1 PO5 PO9 POl2	Maps Moderately	Modem design tool usage for software system, component, mem within realistic constraints has been analyzed. Function effectively as an individual, and as a member or leader in diverse teams for system design Understand the recent developments and life-long learning.
	PO3 PO4	Maps Strongly	The knowledge of Software analysis and design helps in development of software solutions
CO4	PO2 PO6 PO8 PO10	Maps Slightly	Ethically analyze cost estimation and time scheduling for quality project activities. By applying engineering knowledge and Communicate effectively on complex engineering project activities
	PO3 PO5 PO7 PO9	Maps Moderately	Using modern tools in project scheduling, design solutions for complex engineering problems and function effectively as an individual: and as a member or leader in diverse teams in sustainable project development.
	PO1 PO4 PO11 PO12	Maps Strongly	The knowledge of basics of computer science, analyze, demonstrate knowledge and understanding of the engineering and management principles. Understand project management and finance.

CO5	PO5 PO6 PO7 PO8 PO9 PO10 PO11	Maps Slightly	Function effectively as an individual and as a member or leader in diverse teams, modem engineering and IT tools used for ethically Analyze, design: implement: verify, validate: maintain software systems with metrics with knowledge to assess societal: health: safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
	PO1 PO2 PO12	Maps Moderately	The knowledge of basics of computer science will help the students to analyze, design, implement, verify, validate, maintain software systems. Understand the recent developments and life-long learning.
	PO3 PO4	Maps Strongly	Analyze and design solutions for complex engineering problems
CO6	PO2 PO6 PO7 PO10 P011	Maps Slightly	Analyze complex engineering problems reaching substantiated conclusions with knowledge to assess societal, health, safety, legal and cultural issues in sustainable development. Communicate effectively on complex engineering activities and Project management.
	PO1 PO5 PO8 PO9 PO12	Maps Moderately	The knowledge of basics of computer science will help the students to ethically apply appropriate techniques for software development. Function effectively as an individual, and as a member or leader in diverse teams. Understand the recent developments and life-long learning.
	PO3 PO4	Maps Strongly	Conduct investigations and Design solutions for complex software engineering problems using agile software development.

CO1	**PSO**	**Level**	**Justification**
	PSO1 PSO2	Maps Slightly	The knowledge of basics of computer science will help the students to assess professional and ethical responsibility, software engineering principles and activities involved in building large software programs.
	PS03	Maps Moderately	The knowledge of software engineering principles and activities involved in building large software programs helps in student careers in the software industry or pursue higher studies and continue to develop their professional knowledge.
	PSO4	Maps Strongly	The knowledge of professional and ethical responsibility used to practice the profession with ethics, integrity, leadership and social responsibility.
CO2	PSO1 PSO4	Maps Slightly	The process of requirements gathering, classification, specification and validation knowledge helps in building solid foundation in the principles and practices of computer science, leadership and social responsibility.
	PSO2 PSO3	Maps Moderately	Requirements gathering skills used to communicate effectively using modem tools and prepare students for careers in the software industry

CO3	PSO1 PSO4	Maps Slightly	The knowledge of computer science used to understand design models for software system, component, process demonstrate leadership and social responsibility.
	PSO3	Maps Moderately	Design knowledge prepare students for their careers in the software industry or to pursue highs studies and continue to develop their professional knowledge
	PSO2	Maps Strongly	Software design skills helps student to function as member of multi-disciplinary teams
CO4	PSO1 PSO3 PSO4	Maps Moderately	The knowledge of basics of computer science will help the students to apply the same and exploit quality project activities, leadership and social responsibility. Prepare students for their careers in the software industry or pursue higher studies and continue to develop their professional knowledge.
	PSO2	Maps Slightly	Cost estimation and time scheduling for quality project activities Skills used to function as members of multi-disciplinary teams and to communicate effectively using modern tools.
CO5	PSO1 PS02	Maps Slightly	The knowledge of basics of computer science will help the students to Analyze, design, implement, verify, validate, maintain software systems. Understand to communicate effectively using modem tools.
	POS4	Maps Moderately	Students learn to practice the profession with ethics, integrity, leadership and social responsibility.
	PSO3	Maps Strongly	Students prepared for their careers in the software industry or pursue highs studies and continue to develop their professional knowledge.
CO6	PS02 PSO4	Maps Slightly	Agile software development Skills used to function as members of multi-disciplinary teams and to communicate effectively using modern tools. Students learn to practice the profession with ethics, integrity, leadership and social responsibility
	PS03	Maps Strongly	Agile development helps Student to prepare for their careers in the software industry or pursue highs studies and continue to develop their professional knowledge.

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS46-DATA COMMUNICATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify various types of computer networks and connecting devices.	2	2	1	1								2	3	1	2	
CO2	Evaluate the data transmission techniques.	3	3	3	2								3	3	1	2	
CO3	Illustrate TCP/IP protocol suite and switching criteria.	2	1	2	2								2	3	2	2	
CO4	Analyze different error checking methods used in Data Link layer.	3	3	2	3	1							1	3	2	3	
CO5	Demonstrate medium access control protocols, wireless and wired LAN architecture.	3	3	2	3								1	3	2	2	
CO6	Differentiate IP versions : IPV4, IPV6 and Mobile IP.	3	3	2	3	1							2	3	2	3	

CO1	**PO**	**Level**	**Justification**
	PO1 PO2 PO12	Maps moderately	The knowledge of mathematical principles and basics of computer science , networking will help the students to apply the same and identify various types of networks ,and understand the structure of network . Understand the recent developments in networking and life-long learning.
	PO3 PO4	Maps slightly	Students are able to understand bandwidth requirement, delay.
CO2	PO1 PO2 PO3 PO12	Maps Substantially	The knowledge on data transmission techniques helps students to understand the basics of networking, mathematical principles and explore their knowledge towards research.
	PO2	Maps Moderately	Analyse the effect of noise in data transmission.
CO3	PO1 PO3 PO4 PO12	Maps Moderately	The knowledge of networking,working of TCP/IP protocol suite , concept of routers and switches enables students to exploreideas towards research and projects
	PO2	Maps Slightly	Challenges of line coding can be analyzed.
CO4	PO1 PO2 PO4	Maps Substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and exploit error checking methods like CRC, Hamming Code
	PO3	Maps Moderately	Helps to design solutions for error checking methods
	PO5 PO12	Maps slightly	The problem with even and odd number of errors can be taken up as research.
CO5	PO1 PO2 PO4	maps Substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and identify different techniques used in avoiding collision during data transmission.
	PO3	Maps Moderately	Students learn Wireless architecture.
	PO5	Maps slightly	NS3 tool is used to simulate the network.
CO6	PO1 PO2	maps substantially	The knowledge of basics of computer science will help the students to perceive and enhance the IP address format and the interpretation of each field.

	PO4		
	PO12 PO3	Maps Moderately	Mobile IP helps to open up in research.
	PO5	Maps Slightly	NS3 tool is used to analyse nodes in the network

CO	PSO	Level	Justification
CO1	PSO1	Maps substantially	Students will have solid foundation in the principles and practices of computer science, including mathematics, science and basic engineering.
	PSO2	Maps Slightly	Ns3 tool is used to evaluate the performance of network
	PSO3	Maps Moderately	Students can excel in network platforms.
CO2	PSO1	Maps substantially	Students will have solid foundations in data transmission schemes
	PSO2	Maps Slightly	Having the knowledge on data transmission students can work in multiple discipline
	PSO3	Maps Moderately	Knowledge on transmission techniques are used in industry.
CO3	PSO1	Maps substantially	The graduates will have solid foundation in the principles of networking
	PSO2	Maps Moderately	Students can excel in network platforms.
	PSO3	Maps Moderately	The graduates of the Program will be prepared for their careers in the software industry or pursue higher studies
CO4	PSO1	Maps substantially	Students will have solid foundation in the principles including mathematics, science and basic engineering.
	PSO2	Maps Moderately	Students can excel in hardware of software fields.
	PSO3	Maps substantially	Its opens up the idea on research.
CO5	PSO1	Maps substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and exploit error checking methods like CRC, Hamming Code
	PSO2	Maps Moderately	Different methods are used for error checking codes.
	PSO3	Maps Moderately	Students are able to identify different techniques used in avoiding collision during data transmission.
CO6	PSO1	Maps substantially	Gives the fundamental knowledge in IP address
	PSO2	Maps Moderately	Using NS3 tool gives the knowledge on IP address, sub-net mask.
	PSO3	Maps substantially	Having a sound knowledge in IP versions student can show interest in higher studies and research.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CSL47-DAA LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Develop solutions for computing problems using JAVA constructs.	3	2	2	1	1			1	2	2		3	3	1	3	
CO2	Design, implement and asymptotically analyze various algorithms on Sorting.	3	3	3	1	1				2	2		3	3	1	2	
CO3	Design and implement algorithms to solve problems on Graphs.	3	3	3	1	1				2	2		3	3	1	2	
CO4	Design and develop algorithms to solve combinatorial problems.	3	3	3	1	1				2	2		3	3	1	2	
CO5	Choose appropriate algorithmic techniques to solve computational problems.	3	2	3	2	1	1			3	1	1	3	2	1	2	
CO6	Analyze algorithms to deduce their time complexities.	3	3	1	1								2	2		2	

CO1	**PO**	**Level**	**Justification**
	PO1,PO12	maps substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the samein life long learning.
	PO2,PO3, PO9,PO10	Maps moderately	Performance analysis helps the students to gain the research based knowledge and life-long learning.
	PO4,PO5, PO8	Maps slightly	Enables students to analyze the complex problems and develop solutions using eclipse tool, and designer should know their responsibilities and norms of engineering practise while developing the solutions.
CO2	PO1,PO2, PO3,PO1 2	Maps substantially	To asymptotically analyze the algorithms knowledge on mathematical principles is required, analyzing the various sorting solutions to choose the best and implementing it and apply the same in life long learning.
	PO9,PO10	Maps moderately	Documentation is made by analyzing the worst case, best case and average case effectively.
	PO4,PO5	Maps slightly	Tools used are eclipse for programming and microsoft excel to plot graph to analyze the performance.
CO3	PO1,PO2, PO3,PO12	Maps substantially	Students will gain knowledge on graphs, learn to choose the best routing algorithm and its working and to applythe same in life long learning.
	PO9,PO10	Maps moderately	Network problems are represented to graphs and effectively can find the solutions to complex routing problems.
	PO4,PO5	Maps slightly	Conduct investigation on complex problems.
CO4	PO1,PO2, PO3,PO12	Maps substantially	Students perceived knowledge on problems like travelling sales person problem and developed solutions for the same. Life long learning is involved to improve the time complexity.
	PO9,PO10	Maps moderately	Documentation is maintained.
	PO4,PO5	Maps slightly	Tools used are java eclipse.
CO5	PO1,PO3, PO9,PO12	Maps substantially	Gained knowledge on computational problems like sum of subsets, hamiltonian cycle. Developed solution for the same. Also documentation is maintained.
	PO2,PO4	Maps moderately	Analysis were made to decide which algorithmic technique should be used to solve problems.
	PO5,PO6, PO10, PO11	Maps slightly	Solution is developed using java eclipse and developed solution is useful to society.
CO6	PO1,PO2	maps substantially	After studying the various algorithmic approaches Enables to derive time complexities and can analyze the various solutons
	PO12	Maps moderately	Life long learning is involved to choose the algorithmic techniques inorder to improve the time complexity.
	PO3,PO4	Maps slightly	After analyzing the algorithms, students are able to develop the solution and can conduct further investigation for complex problems.

CO	PSO	Level	Justification
CO1	PSO1 PSO3	Maps substantially	The graduates of the Program will have solid foundation in the principles and practices of computer science, including mathematics, science and basic engineering to solve simple computational problems. Through thisgraduates will be prepared for their careers in software industry.
	PS02	Maps slightly	Solution is developed using java eclipse and can be used in multi disciplinary teams.
CO2	PSO1	Maps substantially	Enables to gain knowledge on asymptotic notations.
	PSO3	Maps moderately	Once the algorithmic approaches are well versed, students can decide the approach to develop the solution which will be helpful for the careers in the software industry.
	PSO2	Maps slightly	Knowledge on asymptotic analysis will help the students to work in multi disciplinary teams.
CO3	PSO1	Maps substantially	Students will get solid foundation on graph based problems.
	PSO3	Maps moderately	Graph problems are related to network problems. Knowledge on this will help the students to work in network domains.
	PSO2	Maps slightly	All these solutions are developed in eclipse.
CO4	PSO1	Maps substantially	Combinatorial problems give strong foundation in mathematical principles and basics of computer science.
	PSO3	Maps moderately	Graduates will be prepared for the careers, gain professional knowledge.
	PSO2	Maps slightly	Combinatorial problems are developed using java eclipse.
CO5	PSO1 PSO3	Maps moderately	Knowledge on computational problems will give strong foundation on mathematical principles. And also higher studies can be made on this.
	PSO2	Maps slightly	Computational problems are developed using java eclipse.
CO6	PSO1 PSO3	Maps moderately	Analysis of algorithms means, analyzing the time complexity. To do this, strong mathematical background is required. Once analysis is done, solutions are developed which would be helpful to start careers in the softwareindustry.

17CSL48- MICROPROCESSOR AND MICROCONTROLLER IABORATORY

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate x86 instruction set and addressingmodes	2	1	-	-	-		-	-	-	-	-	1	2		1	2
CO2	Design and implement x86 assembly languageprograms.	2	-	-	2	2	-	-	-	-	-	-	1	3	1	2	2
CO3	Explore the functioning of hardware devices andits interfacing	2	--	2	-	2	-	-	-	-	-	-	2	2	1	2	2
CO4	Demonstrate ARM instruction set and addressingmodes.	2	-	2	1	2	-	-	-	-	-	-	2	2	1	2	2
CO5	Implement ARM assembly and C languageprograms.	2	1	2		2	-	-	-	-	-	-	2	2	1	2	2
CO6	Implement interfacing of hardware devices toARM family	2	-	-	-	-	-	-	-	-	-	-	1	2	2	2	2

CO1	**PO**	**Level**	**Justification**
	PO1	Maps moderately	Students will be able to apply the knowledge of engineering fundamentals to understand the 8086 instructions
	PO1 PO12	Maps slightly	Help students to recognize the need for 8086 Instructions and working.
CO2	PO1 PO4 PO5	Maps moderately	Students can apply the knowledge of engineering fundamentals to implement 8086 programs to solve the problems.
	PO12	Maps slightly	Acquires the working nature of Microprocessor 8086 Instructions.
CO3	PO1 PO3 PO5 PO12	Maps moderately	Develops various Interfaces to acquire the knowledge of Interfacing of 8086 Instructions with Hardware devices and interfacingboard.
CO4	PO2 PO3 PO5 PO12	Maps moderately	Graduate acquires the knowledge of ARM instruction set and Addressing Modes and Implementation of instruction are used indevelopment of Embedded system software.
	PO4	Maps slightly	Graduate acquires the knowledge of ARM instruction set and Addressing Modes.
CO5	PO2	Maps slightly	Execution of C programs in ARM environment is learned.
	PO2 PO3 PO5 PO12	Maps moderately	Interfacing of ARM Instructions and C programming Instructions are developed to interact with devices.
CO6	PO1	Maps moderately	Acquires the knowledge of development of Interfaces of Arm processors with Externals hardware devices and achievescommunication.
	PO12	Maps slightly	Graduates gains the Interfacing of hardware devices and Interfacing with ARM

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS51-MANAGEMENT ENTREPRENEURSHIP FOR IT INDUSTRY

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Comprehend Management activities	1		1	1		1	1		1		2	2	1	1	1	1
CO2	Emphasize Entrepreneur concepts and outline their importance in entrepreneurship	1	1	1	2		1	1	1	2		2	1	1	1	2	1
CO3	Apply Enterprise Resource Planning (ERP) solutions for IT industry	3	3	3	3		1	3	1	2		1	1	3	2	3	1
CO4	Propose the methods for establishing micro, small and large scale enterprises	1	2	2	2		1	1	2	1		1	1	1		1	2
CO5	Apply IPRs and institutional support for entrepreneurship	1	1	2	1		1	3	3	1	2	1	2	2		1	2
CO6	Prepare project report for IT industry based on feasibility studies	3	3	3	3		3	3	2	3	3	1	3	3		3	1

CO1	**PO**	**Level**	**Justification**
	PO11PO12	maps moderately	The management principles and activities enable the students to develop overall personality to work as an individual, team member and further enhance his skills to become a leader.
	PO1 PO3 PO4PO6 PO7PO9	Maps slightly	The students will be able to understand concepts of managements activities which enhances behavior , personality and ethically.
CO2	PO4 PO9 PO11	Maps moderately	The Entrepreneur concepts will enable the students to work individually as a team member and helps to build leadership quality.
	PO1 PO2 PO3 PO6 PO7 PO8 PO12	Maps slightly	The Entrepreneur concepts outlined make the students to understand the basic ethical engineering principles to provide solutions to the problems faced by the people, which will motivate to become entrepreneur.
CO3	PO1 PO2 PO3PO4 PO7	Maps Highly	The application of ERP will provide solution for complex engineering problems based on investigation done by research through strong science and engineering knowledge ,which is essential for sustainable development.
	PO9	Maps moderately	The gain knowledge can be applied and useful to multi disciplinary environment.
	PO6 PO8 PO11 PO12	Maps slightly	The ERP concepts described will enable the students to develop solutions, useful for the society in managing the projects in multidisciplinary environment.
CO4	PO1 PO3 PO4PO8	Maps moderately	The proposed methods will enable the students to establish micro, small and large scale enterprises based on engineering principles can be useful to solve complex engineering problems and make them professionals with ethics.
	PO1 PO6 PO7 PO9 PO11PO12	Maps slightly	By the proposed methods the students will be able to understand the basic engineering principles, to establish the enterprises on their own which are beneficial to the society .
CO5	PO7PO8	Maps Highly	The IPRs will protect the creativity of the minds of the people, which can be utilized for providing an innovative engineering solutions to the society.
	PO3	maps moderately	The IPRs will protect the interest of the society at large
	PO10PO12		
	PO1 PO2 PO4PO6 PO9 PO11	Maps slightly	The Institutional support will enable the students to realize and implement the complex engineering problems which are beneficial to the individual and society as a whole.
CO6	PO1 PO2 PO3 PO4 PO6 PO7 PO9 PO10 PO12	Maps Highly	The generation of project reports based on strong engineering domain knowledge in a specific application to provide solutions to complex engineering problems designed which would enable them to take up the career as an industrialist based on feasibility studies.

	PO8	maps moderately	The contents of the project reports should be developed ethically.
	PO11	Maps slightly	The project report should be prepared taking into account of financial aspects.

CO1	**PSO**	**Level**	**Justification**
	PSO1 PSO2 PSO3 PSO4	Maps slightly	The management concepts studied will be the basis for the students to prepare their careers in software industry with ethics, integrity and leadership qualities through basic engineering concepts.
CO2	PSO3	maps moderately	The Entrepreneurial concepts and emphasis on their importance will motivate the students to take up the career in software industry and higher studies.
	PSO1 PSO2 PSO4	Maps slightly	The Entrepreneurial concepts will be helpful for the students to become an entrepreneur with ethics, integrity with social and moral responsibility in software industry through basic engineering principles.
CO3	PSO1 PSO3	Maps Highly	The solid foundations of principles and practices of Computer science and engineering will enable the students to provide effective solutions to solve the problems of IT industry by applying Enterprise Resource Planning (ERP) concepts.
	PSO2	Maps moderately	The knowledge gained by Enterprise Resource Planning (ERP) concepts will enable the students to communicate and develop the skills in multi disciplinary environment.
	PSO4	Maps slightly	The ERP concepts may encourage the students may take up this as a profession .
CO4	PSO4	Maps moderately	The proposed methods of micro, small and large scale enterprises will enable the students to set up these industries which enhances their leadership qualities with ethics and social responsibility.
	PSO1 PSO3	Maps slightly	The establishing of micro, small and large scale enterprises requires knowledge of basic engineering principles to take up as career in software industry.
CO5	PSO1 PSO4	Maps moderately	The knowledge of Computer science and engineering and IPR are essential to practice the profession with ethics, integrity, leadership and social responsibility. Apply IPRs and institutional support for entrepreneurship
	PSO3	maps slightly	The institutional support may facilitate the students to become an entrepreneur in IT industry
CO6	PSO1 PSO3	maps Highly	The knowledge of principles and practices of Computer science and engineering will enable the students to prepare the project report and become entrepreneur in IT industry after thorough feasibility studies. Prepare project report for IT industry based on feasibility studies
	PSO4	maps slightly	The preparation of project report for IT industry based on feasibility studies should be done with ethics, integrity and social responsibility

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS52-COMPUTER NETWORKS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate the principles of application layer protocols.	3	2	1			1	1					2	3	1	2	
CO2	Distinguish transport layer services and protocols.	3	3	2	2	3	1	1					2	3	1	2	
CO3	Classify IP and Routing Algorithms in network layer.	3	3	2	3	3	1	1					2	3	2	2	
CO4	Characterize the Wireless and Mobile Networks covering IEEE 802.11 Standard.	2	1		2	3	1	1					3	2	1	3	
CO5	Demonstrate streaming and working of Distribution servers.	1			1		1	1					1	1	1	2	
CO6	Exemplify Network support for multimedia.				1		1						1			1	

CO1	**PO**	**Level**	**Justification**
	PO1	Maps Strongly	The knowledge of strong basics of mathematical and engineering principles help students to demonstrate the principles of application layer protocols.
	PO2 PO12	Maps moderately	Analysis of application layer protocols helps students to understand the existing system. Life long learning required to bring in the new developments in the upcoming applications
	PO3 PO6 PO7	Maps slightly	Development of any new application layer protocol needs analysis and design procedures of new protocol and understanding the impact onsocietal and environmental contexts
CO2	PO1 PO2 PO5	Maps Strongly	The knowledge of strong basics of mathematical and engineering principles help students to demonstrate the applications and services of transport layer protocols. Analysis skills required are mandatory whenever deciding the relevant protocol that should be configured for any application. Tools like NS3 help students and to realize the working of protocols.
	PO3 PO4 PO12	Maps moderately	It helps students to come up with design strategies and arriving at solutions for the complex problems
	PO6 PO7	Maps slightly	Networking concepts are applied in various domains and hence it is relevant relate transport layer services to understand the impact of the professional engineering solutions in societal and environmental contexts
CO3	PO1 PO2 PO4 PO5	Maps Strongly	The knowledge of strong basics of mathematical and engineering principles help students to demonstrate the Network layer protocols. Analysis skills required are mandatory whenever deciding the relevant protocol that should be configured for any application and also for debugging complex problems. Tools like NS3 help students and to realize the working of protocols.
	PO3 PO12	Maps moderately	It helps students to come up with design strategies of any modifications required and induces life long learning
	PO6 PO7	Maps slightly	Networking concepts are applied in various domains and hence it is relevant to relate network layer services to understand the impact of the professional engineering solutions in societal and environmental contexts
CO4	PO5 PO12	Maps Strongly	Networking concepts are applied in various domains in day to day activities and hence induces life long learning. Tools like NS3 help students and to realize the working of protocols.
	PO1 PO4	Maps moderately	The knowledge of strong basics of mathematical and engineering principles help students to demonstrate the principles of application layer protocols. It enables student in Debugging solutions for complex problems.
	PO2 PO6 PO7	Maps slightly	wireless and mobile network concepts are widely used in various domains. Analysis skills will help students to understand its impact in societal and environmental contexts.
CO5	PO1 PO4 PO6 PO7 PO12	Maps slightly	The knowledge of basics of mathematical and engineering principles and debugging help students to demonstrate streaming and working ofDistribution servers. Frequent upgrades of Distribution servers is inducing life long learning.
CO6	PO4 PO6 PO12	Maps slightly	Multimedia networking is multidisciplinary and regular updates in the domain leads to life long learning.

CO1	**PSO**	**Level**	**Justification**
	PSO1	Maps Strongly	The knowledge of strong basics of mathematical principles and computer architecture will help the students to apply and identify functionalities of different application layer protocols.
	PSO3	Maps moderately	Development of any new application in multidisciplinary environment requires longevity of learning
	PSO2	Maps slightly	Networking concepts are applied in various domains and hence students will gain skills to function as members of multi- disciplinary teams
CO2	PSO1	Maps Strongly	The knowledge of strong basics of mathematical principles and computer architecture will help the students to apply and identify functionalities of different transport layer protocols.
	PSO2	Maps moderately	Networking concepts are applied in various domains and hence students will gain skills to function as members of multi- disciplinary teams
	PSO3	Maps slightly	Transport layer services are required to establish communication and hence lifelong learning is necessary
CO3	PSO1	Maps Strongly	The knowledge of strong basics of mathematical principles and computer architecture will help the students to identify andapply functionalities of different network layer protocols.
	PSO2 PSO3	Maps moderately	Development of any new network layer protocol needs the understanding of its working in multidisciplinary environment and requires longevity of learning
CO4	PSO3	Maps Strongly	Networking concepts are applied in various domains in day to day activities and hence induces life long learning.
	PSO1	Maps moderately	The knowledge of strong basics of mathematical and engineering principles help students to demonstrate the principles of application layer protocols. It enables student in Debugging solutions for complex problems.
	PSO2	Maps slightly	Mobile networks are used in various domains and hence students will gain an . students will gain skills to function as members ofmulti-disciplinary teams
CO5	PSO3	Maps moderately	Frequent upgrades of Distribution servers induces life long learning.
	PSO1 PSO2	Maps slightly	The knowledge of mathematical principles and basics of computer science will help the students to understand the concepts ofCDNs.
CO6	PSO3	Maps slightly	Multimedia networking is multidisciplinary and regular updates in the domain leads to life long learning.

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS53-DATABASE MANAGEMENT SYSTEM

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Represent database with different data modeling concepts.	2	-	2	-	-	-	-	-	1	-	-	1	3	1	1	-
CO2	Design simple database systems.	3	2	3	2	-	-	1	-	1	-	-	2	2	1	1	-
CO3	Use Structured Query Language (SQL) forbuilding and manipulating database.	2	1	1	1	3	-	-	-	2	-	-	3	3	3	3	-
CO4	Develop application to interact with databases.	1	-	3	1	3	-	1	1	2	-	-	2	2	3	2	1
CO5	Analyze and apply normalization forbetter database design.	2	2	2	2	-	-	-	-	-	-	-	2	2	1	2	-
CO6	Demonstrate the use of concurrencycontrol and transaction processing.	1	-	1	2	2	-	1	1	1	-	-	2	2	2	2	1

	PO	Level	Justification
CO1	PO1PO3	Maps moderately	Fundamental knowledge of mathematics, science, engineering are used by students to represent database with different data modeling concepts and design solutions for complex engineering problems.
	PO9 PO12	Maps slightly	Students are able to function effectively as an individual and team and engage in independent and life-long learning.
CO2	PO2 PO4 PO12	Maps moderately	Students are able to Identify, formulate, analyze complex engineering problems by designing simple database design and conduct investigations. Engage in independent and life-long learning.
	PO7PO9	Maps slightly	Design simple database systems by applying ethical principles and commit to professional ethics and responsibilities and Function effectively as an individual and team.
	PO1PO3	Maps Substantially	To design and develop database system student apply Fundamental knowledge of mathematics, science, engineering
CO3	PO1PO9	Maps moderately	Students can Build and manipulate database using SQL by applying fundamental knowledge of engineering and work in team and as individuals
	PO5 PO12	Maps Substantially	Student use modern tools to build and manipulate database.Engage in independent and life-long learning.
	PO2 PO3PO4	Maps slightly	Using SQL students can identify, formulate and design solutions for complex engineering problems.
CO4	PO1 PO4 PO7 PO8	Maps slightly	Students can design and develop database applications by applying fundamental knowledge of mathematics, science, engineering using modern tools for sustainable development. Ethics to be practiced in design and development.
	PO9 PO12	Maps moderately	Students can design and develop database applications individually or in team,it is a life long learning process in context of technological change.
	PO3PO5	Maps Substantially	Design solutions for complex engineering problems using modern tools.
CO5	PO1 PO2 PO3 PO4 PO12	maps moderately	Analyze and apply normalization for better database design and development.by applying fundamentals of mathematics, science, and engineering in the context of changing technology.
CO6	PO1 PO3 PO7 PO8 PO9	Maps slightly	Demonstrate the use of concurrency control and transaction processing by applying fundamental knowledge for real world problems with transparency in societal and environmental contexts.
	PO4 PO5 PO12	Maps moderately	Using database tools to achieve concurrency, database consistency for real world problems.

CO1	**PSO**	**Level**	**Justification**
	PSO1	Maps moderately	Graduates of the Program will have solid foundation in Represent database with different data modeling concepts.
	PSO2 PSO3	Maps slightly	The graduates of the Program will have skills to function as member of database development team and to perform effectively in the software industry
CO2	PSO1	Maps moderately	The graduates of the Program will have solid foundation to design simple database systems.
	PSO2 PSO3	Maps slightly	The graduates of the Program will have skills to function as member of database development team and to perform effectively in thesoftware industry
CO3	PSO1 PSO2 PSO3	Maps Substantially	The graduates of the Program will have solid foundation in the principles and practices of database development in the software industry and to communicate effectively using modern tools.
CO4	PSO1 PSO3	Maps moderately	The graduates of the Program will have solid foundation for design and development of database applications in the software industry
	PSO2	Maps Substantially	The graduates of the Program will have skills to function as members of multi-disciplinary teams and to communicate effectively using modern tools for development of database applications.
	PSO4	Maps slightly	The graduates of the program will practice the profession with ethics and integrity
CO5	PSO1 PSO3	Maps moderately	The graduates of the Program will have solid foundation to Analyze and apply normalization for better database design in the softwareindustry
	PSO2	Maps slightly	The graduates of the Program will have skills to function as members of database development team byapply normalization for better database design using modern tools.
CO6	PSO1 PSO2 PSO3	Maps moderately	The graduates of the Program will have solid foundation to implement concurrency control and transaction processing in database development process.
	PO4	Maps slightly	The graduates of the program will practice the profession with ethics to achieve transparency in database transactions.

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS54-AUTOMATA THEORY & COMPUTABILITY

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation	3	3	3	2								2	3	1		-
CO2	Translate between different models of Computation	2	3	3	2								2	2	2		-
CO3	Design Grammars and Automata for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.	2	2	2	2			1					1	2	2	2	-
CO4	Apply rigorously formal mathematical methods to prove properties of languages, grammars and automata	2	2	2	2			1					1	2	2	2	
CO5	Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness.	2	1	1	3								2			2	
CO6	Classify a problem with respect to different models of Computation	2	1	1	1								2			2	

CO1	**PO**	**Level**	**Justification**
	PO1 PO2 PO3	maps substantially	Knowledge of mathematics, engg fundamentals will help the student to identify ,formulateAnd analyze to develop engg. Problems.
	PO4 PO12	Maps moderately	Core concepts help students to design,analyze and interpret the data and to modelany real time problem.
CO2	PO1 PO4 PO12	Maps moderately	Apply of engg. Fundamentals helps students to synthesize model translation which helps for real time situation.
	PO2 PO3	Maps substantially	Identify, formulate and design solution for different models translation.
CO3	PO1 PO2 PO3 PO4	Maps moderately	Identify, formulate and design solution for research based problems using grammars and automata.
	PO7 PO12	Maps slightly	Mathematical model of automata and grammars are required for real-time solutions.
CO4	PO1 PO2 PO3 PO4	Maps moderately	Identify,formulate,design solution for research problems using properties of automataand grammars.
	PO7 PO12	Maps slightly	Mathematical model of automata and grammars are required for real-time solutions.
CO5	PO1 PO12	Maps moderately	Knowledge of mathematics and basics of computer will help the students to build reduced formal models.
	PO2 PO3	Maps slightly	Identify and design solution to reduce the formal models.
	PO4	Maps substantially	Complex problems are analyzed using formal models.
CO6	PO1 PO12	Maps moderately	Engg. Fundamentals help students for real-time problems.
	PO2 PO3 PO4	Maps slightly	Identify formulate design solutions for research based problems using different models of computation.

	PSO	Level	Justification
CO1	PSO1	maps substantially	Fundamental understanding of the core concepts in automata theory and Theory of Computation will give solid foundation.
	PSO2	Maps slightly	Fundamental understanding of the core concepts in automata theory and Theory of Computation will give skills in multi-disciplinary teams and to communicate effectively using modern tools
CO2	PSO1 PSO2	Maps moderately	Translation between different models will give solid foundation and skills in multi-disciplinary teams.
CO3	PSO1 PSO2 PSO3	Maps moderately	Designing Grammars and Automata will give solid foundation ,skills in multi-disciplinary teams and can pursue higher studies in theory of computation or formal modelling.
CO5	PSO3	Maps moderately	Developing skills in formal reasoning will help students to pursue higher studies in theory of computation or formal modelling.
CO6	PSO3	Maps moderately	Classifying a problem with respect to different models of Computation will give idea to pursue higher studies in theory of computation or formal modelling.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS553-ADVANCED JAVA AND J2EE

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Interpret enumerations and collections in advanced Java.	1				2							2	2		2	
CO2	Build programs using collection framework.	1	1	2		2							2	2	1	2	
CO3	Illustrate and develop String Handling methods in JAVA.	2	1	2		2							2	2		2	
CO4	Apply Servlets to develop web applications.	3	2	2	2	2				1		1	2	2	1	2	
CO5	Demonstrate database access using JDBC API.	3	2	2	1	2	1		1	1		1	2	2	1	2	1
CO6	Design reusable software components using JSP.	2	2	3	1	2	1			1		1	2	1	1	2	

CO1	**PO**	**Level**	**Justification**
	PO5 PO12	maps moderately	Modern engineering and IT tools will help students to understand collections framework and helps to engage in independent and life-long learning.
	PO1	Maps slightly	The basics of computer science will help students to understand and write programs with enumerations.
CO2	PO3 PO5 PO12	Maps moderately	Designing solutions for complex engineering problems with collection framework by using modern engineering and IT tools, also enable students to Recognize the need for, and have the preparation and ability to engage in independent and life-long learning.
	PO1 PO2	Maps slightly	Students can apply the knowledge of engineering fundamentals to analyze complex engineering problems using collection framework.
CO3	PO1 PO3 PO5 PO12	Maps moderately	The basics of computer science will help the students to illustrate strings by using modern engineering and IT tools and recognize the need of Strings in JAVA.
	PO2	Maps slightly	Identify, formulate and analyze complex engineering problems with different String handling methods.
CO4	PO1	Maps substantially	Help students to develop web applications with the knowledge of engineering fundamentals, and an engineering specialization tothe solution of complex engineering problems.
	PO2 PO3 PO4 PO5 PO12	Maps moderately	Students can Identify, formulate, and analyze complex engineering problems, servlets helps in designing the solutions.Servlet methods help in design of experiments using modern engineering and IT tools this also enable students to engage in independent and life-long learning.
	PO9 PO11	Maps slightly	Help students apply Servlets knowledge to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
CO5	PO1	Maps substantially	Help students to develop client server applications using JDBC API's with the knowledge of engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 PO3 PO5 PO12	maps moderately	Students can Identify, formulate, and analyze complex engineering problems, JDBC API's helps in designing the solutions and also help in design of experiments using modern engineering and IT tools this enable students to engage in independent and life- long learning.
	PO4 PO6 PO8 PO9 PO11	Maps slightly	Students shall Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineeringpractice while developing complex client-server applications that Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
CO6	PO3	Maps substantially	Help students to develop client server applications using JSP with the knowledge of engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO1 PO2 PO5 PO12	maps moderately	Students can Identify, formulate, and analyze complex engineering problems, JSP's helps in designing the solutions and also help in design of experiments using modern engineering and IT tools this enable students to engage in independent and life-long learning.
	PO4 PO6 PO9 PO11	Maps slightly	Students shall Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineeringpractice while developing complex client-server applications using JSP that Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

CO1	**PSO**	**Level**	**Justification**
	PSO1 PSO3	maps moderately	The graduates of the Program will have solid foundation in the principles and practices of computer science, including basic engineering.Advanced Java helps The graduates to prepared for their careers in the software industry or pursue higherstudies and continue to develop their professional knowledge.
CO2	PSO1 PSO3	Maps moderately	The graduates of the Program will have solid foundation in the principles and practices of computer science, including basic engineering.Collections framework helps The graduates to prepared for their careers in the software industry or pursuehigher studies and continue to develop their professional knowledge.
	PSO2	Maps slightly	Knowledge of Collections framework function as members of multidisciplinary teams and to communicate effectively usingmodern tools.
CO3	PSO1 PSO3	Maps slightly	The graduates of the Program will have solid foundation in engineering.Strings knowledge helps The graduates to preparedfor their careers in the software industry.
CO4	PSO1 PSO3	Maps moderately	The graduates of the Program will have solid foundation in the principles and practices of computer science, including basic engineering.Concept of Servlets helps The graduates to prepared for their careers in the software industry or pursue higher studies and continue to develop their professional knowledge.
	PSO2	Maps slightly	Servets help students to function as members of multidisciplinary teams and to communicate effectively using moderntools.
CO5	PSO1 PSO3	maps moderately	The graduates of the Program will have solid foundation in the principles and practices of computer science, including basic engineering.Concept of JDBC helps The graduates to prepared for their careers in the software industry or pursue higherstudies and continue to develop their professional knowledge.
	PSO2 PSO4	Maps slightly	The graduates of the Program will have skills to function as members of multidisciplinary teams and to communicate effectively using modern tools. The graduates of the program will practice the profession with ethics, integrity, leadershipand social responsibility.
	PO3	Maps substantially	Knowledge of JDBC will help students to prepare for their careers in the software industry..
CO6	PSO3	maps moderately	The concepts of JSP help students to develop their professional knowledge.
	PSO1 PSO2	Maps slightly	Help students to have solid foundation computer science, also enable them to function as members of multidisciplinaryteams and to communicate effectively using modern tools.

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS562-ARTIFICIAL INTELLIGENCE

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PS O4
CO1	Identify the AI based problems	3	1	1	1									2	2	1	
CO2	Determine the technique to solve the AI problems	2	2	2	2									2	2	2	
CO3	Investigate various learning techniques	2	2	2	2									1		1	
CO4	Analyze expert systems	2	2		1	1								1	2	2	1
CO5	Explore different stages in Natural Language processing	2	1		1									2	2	2	
CO6	Implement appropriate learning algorithms	2	2	2	1	1								2		2	

CO1	PO	Level	Justification
	PO1	maps Strongly	The knowledge of mathematical fundamentals and basics of computer science will help the students to apply the samein identification of the AI problems
	PO2 PO3 PO4	Maps Slightly	The knowledge of problem identification, design and investigation will help the students slightly in basicAIbased problem solving
CO2	PO1 PO2 PO3 PO4	Maps Moderately	The engineering knowledge, problem analysis, design and conducting investigation is moderately required in determining the technique to solve the given AI problem

CO3	PO1 PO2 PO3 PO4	Maps Moderately	The engineering knowledge, problem analysis, design and conducting investigation is moderately required in determining the selection of design technique
CO4	PO1 PO2	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to analyse the concepts of expert system
	PO4 PO5	Maps slightly	Expert system requires moderate knowledge about investigation and modern tool usage
CO5	PO1	maps Moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same inNLP
	PO2 PO4	Maps slightly	The identification of problem and conduction of investigation is needed slightly for the NLP
CO6	PO1 PO2 PO3	Maps moderately	Moderate Engineering Knowledge, problem analysis and Design of solution for learning algorithms
	PO4 PO5	Maps slightly	Research method and modern tools may be slightly used in learning algorithms

CO1	**PSO**	**Level**	**Justification**
	PSO1 PSO2	maps Moderately	Solid foundation in principles and help the graduates towork with multi disciplinary teams moderately
	PSO3	Maps Slightly	Slightly help the graduate can prefer to work in the software industry or higher study
CO2	PSO1 PSO2 PSO3	Maps Moderately	Different problem techniques in AI help the graduates in their profession, higher studies and multi disciplinary teamworking environment
CO3	PSO1 PSO3	Maps Slightly	Learning techniques slightly help the graduates in their principles and practices along with higher studies
CO4	PSO2 PSO3	Maps moderately	Expert system is the newly growing area. The graduates will work in the team as well as prefer to pursue in higherstudies
	PSO1 PSO4	Maps slightly	Expert system help the graduates in slightly in their basic engineering knowledge as well as leadership
CO5	PSO1 PSO2 PSO3	maps Moderately	Knowledge of NLP will help the graduate moderately in their engineering practices, multi-disciplinary teams, higherstudies
CO6	PSO1 PSO3	Maps moderately	Moderate knowledge of learning algorithms moderately helping the graduates in foundation of engineering knowledgeas well as higher studies

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COMPUTER NETWORK LAB (17CSL57)

	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate error detection technique using CRC	2	3	1	2						2	1	2	2	1	1	
CO2	Analyze and compare different routing protocols	2	2	1	2						2	1	2	2	1	1	
CO3	Implement connection-oriented and connection-less protocols in the network	2	2	1							2	1	2	2	1	1	
CO4	Demonstrate security features in networks using RSA algorithm	2	2	1	2				1		2	1	2	2	1	1	1
CO5	Analyze techniques to avoid congestion in the network	2	2	1	2						2	1	2	1	1	1	1
CO6	Implement, analyze and evaluate networking protocols using NS3 Tool	2	1			2					1		1	1	1		

	PO	Level	Justification
CO1	PO2	Maps Substantial (High)	The students can able to understanding algorithm, code implementation and demonstration
	PO3 PO11	Maps Slight (Low)	Design and development on real network will be complex process
	PO1 PO4 P10 P12	Maps Moderate (Medium)	Complex problems in networking , analysis and interpretation in research methods
CO2	PO1 PO2 PO4 PO10 P12	Maps moderately	Student required knowledge and presentation skills for designing solution for routing problems in computer networking
	PO3 PO11	Slight (Low)	Student may required strong knowledge on designing solution for complex routing problems in computer networking andperformance analysis which enables them research in routing protocols and social benefits
CO3	PO1 PO2 PO10 PO12	Moderate (Medium)	Student required knowledge on connection-oriented and connection-less protocols and presentation skills for designing solutionfor wired and wireless communication in computer networking
	P3 P11	Slight (Low)	Student may required strong knowledge on complex connection-oriented and connection-less protocols in computer networkingand performance analysis which enables them research in wired and wireless communication and social benefits
CO4	PO3 PO8 PO11	Slight (Low)	Designing and implementing security algorithms in computer network security will be complex process to improve safetymeasures for social benefits. Adopting ethical principles in multidisciplinary environments is tough task
	PO1 PO2 PO4 PO10 PO12	Moderate (Medium)	The students required strong mathematical and computer science and engineering knowledge to solve complex problems related to attacks in communication networks. The student will have more opportunities for professional career and research for life-long learning in context of technological change
CO5	PO1 PO2 PO4 PO10 PO12	Maps moderately	The students required strong mathematical and computer science and engineering knowledge to solve complex problems related to analyze and avoidance of congestion in communication networks. The student will have more opportunities for professional career and research for life-long learning in context of technological change
	PO3 PO11	Maps slightly	Basis for students to design and implementation of avoidance of congestion in computer network for improving QoS for social benefits.
CO6	PO1 PO5	maps moderately	The students are able to analyze and evaluate networking protocols through simulator using NS3 Tool
	PO2 PO10 PO12	Maps slightly	The students are analyze the different networking protocols through simulator using NS3 Tool

	PSO	Level	Justification
CO1	PSO2 PSO3	Maps slightly	The students with programming skills can able implement programs for error detection in lessscalable networks and they will have opportunities to work in software industry
	PSO1	Maps moderately	The students are able to Demonstrate error detection technique using CRC with fundamental knowledge of computer networks
CO2	PSO2 PSO3	Maps slightly	The students are able to Analyze and compare routing protocol in simple networks and pursue higher studies
	PSO1	Maps moderately	The students with foundation knowledge of computer networking and mathematics able to Analyzeand compare different routing protocols
CO3	PSO2 PSO3	Maps slightly	The students are able to analyse connection-oriented and connection-less protocols in the networkusing modern tools
	PSO1	Maps moderately	The students with foundation knowledge of computer networking and mathematics able to Implementthe connection-oriented and connection-less protocols in the network
CO4	PSO2 PSO3 PSO4	Maps slightly	The students with programming skills can able implement programs for security simple networkattacks
	PSO1	Maps moderately	The students with foundation knowledge of computer networking and mathematics able to demonstrate security features in networks using security algorithm
CO5	PSO1 PSO2 PSO3 PSO4	Maps slightly	The students with computer networking skills can able implement programs for Analyze congestion avoidance in the network
CO6	PSO1 PSO2	Maps slightly	The students with computer programming and networking skills can able to analyze networking protocols using NS3 Tool

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CSL58-DBMS WITH MINI PROJECT LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate DDL commands onDatabase.	1	-	1	-	-	-	-	-	-	-	-	-	1	-	1	
CO2	Create ER diagrams and conceptualschema for the problems given.	2	1	2	1	-	-	-	-	-	-	1	-	2	2	2	
CO3	Apply Integrity constraints	2	2	2	1	-	-	-	-	-	-	1	-	2	2	2	
CO4	Demonstrate Update operations.	1	-	1	-	-	-	-	-		-	-	1	1	-	1	
CO5	Demonstrate more complex SQLqueries.	1	1	1	-	-	-	-	-	-	-	-	1	2	1	2	
CO6	Implement, analyze and evaluate the project developed for an application..	-	2	2	1	-	1	1	-	1	-	2	-	1	-	1	

CO1	PO	Level	Justification
	PO1 PO3	Maps slightly	Fundamental knowledge of engineering are used by students to demonstrate DDL commands to designdatabase.
CO2	PO2 PO4 PO11	Maps slightly	Students are able to identify entities and attributes to create ER diagrams and conceptual schema for theproblems given in syllabus.

	PO1 PO3	Maps moderately	Students are able to create ER diagrams and conceptual schema for the problems given by applying Fundamental knowledge of engineering.
CO3	PO1 PO2 PO3	Maps moderately	Students can apply Integrity constraints on relations using Fundamental knowledge for Problem analysis and design
	PO4 PO11	Maps slightly	Students can **Conduct investigations for** analysis and interpretation of data and indicate these in report.
CO4	PO1 PO3 PO12	Maps slightly	Students can Demonstrate Update operations using fundamental knowledge for development of database inthe context of technological change.
CO5	PO1 PO2 PO3 PO12	maps slightly	Demonstrate more complex SQL queries using Fundamental knowledge of engineering and mathematics for problem analysis and development of database in the context of technological change.
CO6	PO2 PO3 PO11	Maps moderately	Students can implement, analyze and evaluate the project developed for an application using first principles of mathematics, sciences, and engineering.
	PO4 PO6 PO7 PO9	Maps slightly	Projects can address areas like societal, health, safety, legal and cultural issues as individual or team.
CO1	**PSO**	**Level**	**Justification**
	PSO1 PSO3	Maps slightly	Graduates of the Program will have solid foundation in Demonstration of DDL commands
CO2	PSO1 PSO2 PSO3	Maps moderately	The graduates of the Program will have solid foundation in creation of ER diagrams and conceptual schema
CO3	PSO1 PSO2 PSO3	Maps moderately	The graduates of the Program will have solid foundation in applying Integrity constraints on relations and are prepared for their careers in the software industry
CO4	PSO1 PSO3	Maps slightly	The graduates of the Program will have solid foundation for Demonstration of update operations and continue to develop their knowledge. .
CO5	PSO1 PSO3	Maps moderately	The graduates of the Program will have solid foundation to Analyze and apply normalization for better database design in the software industry
	PSO2	Maps slightly	The graduates of the Program will have skills to Demonstrate more complex queries using modern tools.
CO6	PSO1 PSO3	Maps slightly	Graduates of the Program will have solid foundation to Implement, analyze and evaluate the project developed for an application..

17CS61-CNSCL

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO 3	PSO4
CO1	Apply the basics of number theory in various cryptographic techniques and summarize its applications	3	3		1								2	3	2	2	
CO2	Design and develop simple cryptography algorithms for real world situation.	3	3	3	2	2	2		1				2	3	2	2	1
CO3	Analyze various authentication and key agreement protocols.	1	2	1	2	1	1		1				2	2	2	2	1
CO4	Realize the security threats caused by malware, design Firewall based solutions and access control techniques to solve societal security problems.	1	3	3	2	2	2		1				2	2	2	2	1
CO5	Investigate the need of security at different levels/layers and its services.	1	2	2	1	1	1		1				2	1	2	2	1
CO6	Understand cyber security and illustrate the need of cyber Law.	1	2		1		3		2				3		1	2	2

CO	PO	Level	Justification
CO1	PO1 PO2	Substantially	Strong Basics of mathematics and computer science will help the students to Identify, formulate and apply number theory in various cryptographic techniques and summarize its applications
	PO4	Slightly	analysis and interpretation of data helps student to identify cryptographic techniques
	PO12	Moderately	Various cryptographic techniques helps student to prepare for their professional career.
CO2	PO1 PO2 PO3	Substantially	Apply the knowledge of mathematics and basics of computer science to identify and formulate Design and develop simple cryptography algorithms for real world situation
	PO4 PO5 PO6	Moderately	Design, analysis and interpretation of data by applying appropriate techniques for designing solution to various authentication techniques
	PO8	Slightly	develop various cryptographic methods to apply norms of engineering practices.
CO3	PO1 PO3 PO5 PO6 PO8	Slightly	Basics of mathematics and computer science will help the students to identify , design and analyze various authentication and key agreement protocols using modern tools to apply professional ethics.
	PO2 PO4 PO12	Moderately	Identify, formulate and design process to analyze various authentication and key agreement protocols which help the students to engage in life long learning in the context of technological change.
CO4	PO1 PO8	Slightly	Apply the knowledge of computer science to analyze security threats caused by malware, design Firewall based solutions and access control techniques to solve societal security problems by practicing engineering norms
	PO2 PO3	Substantially	Identify, formulate, Design Firewall based solutions
	PO4 PO5 PO6	Moderately	design and analysis Firewall based solutions and access control techniques using modern tools to apply reasoning informed by the contextual knowledge to legal issues.
CO5	PO1 PO4 PO5 PO6 PO8	Slightly	Basics of computer science helps to Investigate the need of security at different levels/layers and its services using appropriate techniques to asses legal issues by appling engineering norms.
	PO2 PO3 PO12	Moderately	Identify, formulate, the need of security at different levels/layers and Recognize the need for, life long learning process.
CO6	PO1 PO4	Slightly	Apply the knowledge of engineering fundamentals to investigate the need for cyber security and illustrate the need of cyber Law
	PO2 PO8	Moderately	Identify and formulate the need for cyber security and cyber Law helps students to understand and commit to professional ethics
	PO6	Substantially	Apply reasoning informed by the contextual knowledge to assess cultural issues and the consequent responsibilities relevant to the professional engineering practice in the field of Computer science.

CO1	**PSO**	**Level**	**Justification**
	1	Substantially	Solid foundation in the principles of computer science including mathematics is required to Apply the basics ofnumber theory in various Cryptographic techniques
	2 3	Moderately	With the knowledge of various cryptographic techniques students will have skills to function as members of multidisciplinary teams and to communicate effectively using modern tools and can be prepared for their careers.
CO2	1	Substantially	Solid foundation in maths and computer science is required to develop cryptographic algorithms.
	2 3	Moderately	Design and develop simple cryptography algorithms for real world situation using modern tools and can be preparedfor their careers in IT industry
	4	Slightly	Cryptographic techniques help students to practice profession with ethics.
CO3	1 2 3	Moderately	Basics of computer science help the students to analyze various authentication and key agreement protocols usingmodern tools. These knowledge can help them in their careers or higher studies.
	4	Slightly	Authentication protocols and key agreement protocols help the students to practice their profession with ethics.
CO4	1 2 3	Moderately	With the Basics of computer science, students can realize the security threats caused by malware, design Firewallbased solutions and access control techniques to solve societal security problems, which can be communicated effectively using modern tools and also help the students to build their careers.
	4	slightly	Students can practice their profession with ethics.
CO5	1 4	slightly	Basics of computer science help the students to Investigate the need of security at different levels/layers and itsservices. And help the students to understand the social responsibility.
	2 3	moderately	Security at different layers help the undergraduates to communicate effectively as members of multidisplinary teams.
CO6	2	Slightly	Graduates can understand cyber security and illustrate the need of cyber Law to function as a multidisplinary teams.
	3 4	Moderately	Understand cyber security and cyber Law help the graduates to develop their professional careers with ethics.

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS62-COMPUTER GRAPHICS & VISUALIZATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Design and implement algorithms for 2D graphics primitives and attributes.	2	1	2	1	2							1	2	2	2	
CO2	Illustrate geometric transformations on both 2D and 3D objects.	2	2	2	1	3				1			2	2	2	2	
CO3	Apply concepts of clipping and visible surface detection in 2D and 3D viewing, and illumination models.	2	3	3	2	3							2	2	2	2	
CO4	Decide suitable hardware and software for developing graphics applications using OpenGL.		1	1	1	3			1	1			1		2	3	
CO5	Explore different representation of Programming event driven input.			2	1	2				1			2	1		3	
CO6	Demonstrate and analyze the concepts of curve surfaces.	2	3	2	3	2				1			2	2		2	

CO1	**PO**	**Level**	**Justification**
	PO1 PO3 PO5	Maps moderately	Representation of primitives and attributes requires engineering knowledge and design. Programs can be designed using OpenGL package.
	PO2 PO4 PO12	Maps slightly	2D graphics requires the knowledge of problem analysis,
CO2	PO1 PO2 PO3 PO12	Maps moderately	Geometric transformation has mathematical calculations
	PO4PO9	Maps slightly	Simple applications can be designed
	PO5	Maps Substantially	2D and 3D representation requires openGL package
CO3	PO1 PO4 PO12	Maps moderately	Initial geometrical concepts are required
	PO2 PO3 PO5	Maps Substantially	Different algorithms of clipping are analyzed
CO4	PO2 PO3 PO4PO8 PO9 PO12	Maps slightly	Knowledge of software and hardware are used for development
	PO5	Maps moderately	Related packages for development
CO5	PO3 PO5 PO12	maps moderately	Different event level programming requires appropriate call back function
	PO4PO9	Maps slightly	Different call back can be used for an application
CO6	PO9	Maps slightly	Can be used for developing simple projects
	PO1 PO3 PO5 PO12	maps moderately	Basic knowledge and representation of lines and points
	PO2 PO4	Maps Substantially	Requires understanding of formulas

CO1	**PSO**	**Level**	**Justification**
	PSO1 PSO2 PSO3	Maps moderately	Knowledge of Graphics is required
CO2	PSO1 PSO2 PSO3	Maps moderately	Geometric transformation requires the understanding of
CO3	PSO1 PSO2 PSO3	Maps moderately	Various Clipping and visible detection are applied
CO4	PSO2	Maps moderately	Hardware and software configuration
	PSO3	Maps substantially	
CO5	PSO1	Maps slightly	event driven program will help for further programming in other areas of computer science
	PSO3	Maps substantially	Software industry requires the usage of callback function
CO6	PSO1 PSO3	Maps moderately	Mathematical representation will help to improve the basic knowledge of computer science and can be used for developing and designing other applications.

17CS63 - System Software and Compiler Design

	Course Outcome	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Interpret the concepts of assemblers and macro processors	2	-	-	-	-	-	-	-	-	-	-	1	1	-	1	-
CO2	Illustrate the functions, features and design options of loader	1	-	-	-	2	-	-	-	-	-	-	1	1	-	1	-
CO3	Classify the phases of compiler and build lexical analyzers	3	2	2	1	2	-	-	-	-	-	-	1	2	1	1	-
CO4	Design parsers for compilers	3	1	1	1	2	-	-	-	-	-	-	2	2	2	1	-
CO5	Construct Syntax Directed Translation and generate intermediate code	2	1	-	1	2	-	-	-	-	-	-	1	2	-	1	-
CO6	Generate ASM code for a given intermediate code	3	1	1	1	-	-	-	-	-	-	-	2	1	-	2	-

	PO	Level	Justification
CO1	PO12	Maps slightly	The students will be to apply the knowledge of assembler design in his life time.
	PO1	Maps moderately	The knowledge of engineering fundamentals will help the students to apply the same in the design of assembler
CO2	PO1 PO12	Maps slightly	The knowledge of engineering fundamentals will help the students to apply the same in the design of loader
	PO5	Maps moderately	The tool-Loader is required to load the program

CO3	PO4 PO12	Maps slightly	The investigation of the given Lex problem is needed slightly.
	PO2 PO3 PO5	Maps moderately	The Lex knowledge may slightly help the students in their problem analysis. Design and development of solutions aswell as the tools available for the Lexers are moderately needed.
	PO1	Maps substaintially	The Lex knowledge may slightly help the students in their problem analysis as well as their higher studies
CO4	PO2	Maps slightly	Good Engineering knowledge, identification of the problem, designing the solutions, preferring the modern tool
	PO3 PO4		usage is strongly recommended for the parsing technique
	PO5 PO12	Maps moderately	The student need to conduct an moderate investigation while designing various parsing technique
	PO1	Maps substaintially	Various parsing techniques may help the students slightly in their multidisciplinary environment as well as theirhigher studies
CO5	PO2, PO4 PO12	Maps slightly	Importance of Translation is known here.
	PO1 PO5	Maps moderately	It helps the students in understanding the requirement of Intermediate code
CO6	PO2 PO3 PO4	Maps slightly	To implement the code generator the student should have a strong fundamental knowledge, problem analysis and development of solutions
	PO12	Maps moderately	The code generator needs an moderate investigation of complex problems
	PO1	Maps substantially	Code generators require a slight knowledge of modern tools, may help slightly in their working with amultidisciplinary team as well as in their preparation for long term learning

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS64-OPERATING SYSTEMS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify the functionalities of OS and theircategories	3	-	1	-	-	-	-	-	-	-	-	2	3	-	1	-
CO2	Evaluate multithread techniques and process scheduling algorithms	2	3	3	2	-	1	1	-	-	-	-	3	2	3	2	-
CO3	Demonstrate suitable techniques for resource management	3	3	3	2	-	1	1	-	-	-	-	2	3	3	1	-
CO4	Evaluate file system allocation andmemory management techniques	3	3	3	2	-	1	1	-	-	-	-	2	3	2	2	-
CO5	Review the protection mechanisms inprocessing environment	-	-	-	-	-	1	-	1	-	-	-	1	1	2	1	1
CO6	Explore the case studies on Operating Systems	-	1	-	-	-	-	-	-	-	2	-	1	-	-	1	1

CO1	**PO**	**Level**	**Justification**
	PO1	Maps Strongly	The knowledge of strong basics of mathematical principles and computer architecture will help the students to applyand identify functionalities of different categories of operating System.
	PO12	Maps moderately	Operating System functionality should be adapted with the new changing environment and requires life long learning.
	PO3	Maps slightly	Development of any new application requires fundamental knowledge of functionalities of OS
CO2	PO2 PO3 PO12	Maps Strongly	Designing Parallel Processing Techniques requires strong analysis skills and longevity of learning.
	PO1 PO4	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply and exploit parallel processing and analyse the processor performance
	PO6 PO7	Maps slightly	Apply multithreading techniques and Scheduling Algorithms to develop applications to solve societal, environmental health, safety, legal and cultural issues for sustainable development.
CO3	PO1 PO2 PO3	Maps Strongly	The knowledge of mathematical principles and basics of computer science will help the students to build concurrencyin application.
	PO4 PO12	Maps moderately	Dead lock management needs analysis and research methodologies to solve complex issues of real world and requires lifelong learning.
	PO6 PO7	Maps slightly	Dead lock Management Skills should be adapted with the new changing environment for sustainability.
CO4	PO1 PO2 PO3	Maps Strongly	The knowledge of mathematical principles and basics of computer science will help the students to design and build various resource management techniques.
	PO4 PO12	Maps moderately	Determine the best memory management technique for different operating systems needs analysis of complex problem solving skills and requires lifelong learning.
	PO6 PO7	Maps slightly	Resource Management Skills should be adapted with the new changing environment for sustainability.
CO5	PO6 PO8 PO12	Maps slightly	Design of Protection mechanisms in processing environment involves Ethical principles for various fields.
CO6	PO10	Maps moderately	Linux operating System can be realized in multidisciplinary environments.
	PO2 PO12	Maps slightly	Upgrading of operating System features requires analysis of existing modules and lifelong learning.

CO1	**PSO**	**Level**	**Justification**
	PSO1	Maps Strongly	The knowledge of strong basics of mathematical principles and computer architecture will help the students to apply and identify functionalities of different categories of operating System.
	PSO3	Maps slightly	Development of any new application in multidisciplinary environment requires fundamental knowledge of functionalities of OS
CO2	PSO2	Maps Strongly	Designing Parallel Processing Techniques requires strong analysis skills to adapt in multidisciplinary environment.
	PSO1 PSO3	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply and exploit parallel processing and analyze the processor performance and longevity of learning.
CO3	PSO1 PSO2	Maps Strongly	The knowledge of mathematical principles and basics of computer science will help the students to build concurrency in different application platforms.
	PSO3	Maps slightly	Dead lock Management Skills should be adapted with the new changing environment for sustainability.
CO4	PSO1	Maps Strongly	The knowledge of mathematical principles and basics of computer science will help the students to design and build various resource management techniques.
	PSO2 PSO3	Maps moderately	Determine the best memory management technique for different operating systems needs analysis of complex problem solving skills and requires lifelong learning.
CO5	PSO2	Maps moderately	Design of Protection mechanisms in processing environment involves Ethical principles for various fields.
	PSO1 PSO3 PSO4	Maps slightly	The knowledge of mathematical principles and basics of computer science will help the students to design Protection mechanisms in processing environment involving Ethical principles
CO6	PSO3 PSO4	Maps slightly	Upgrading of operating System features with Ethical Principles requires analysis of existing modules and lifelong learning.

17CS651-DATA MINING AND DATAWAREHOUSING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify data mining problems and implement thedata warehouse	-	-	-	-	-	-	-	-	-	-	-	2	2	2	-	-
CO2	Define multi-dimensional data models	2	2	-	-	3	-	-	-	-	-	-	2	-	2	2	-
CO3	Categorize types of data and preprocessingtechniques.	1	1	-	1	-	-	-	-	-	-	-	2	1	-	-	-
CO4	Evaluate Association algorithms and itsapplications.	1	2	1	2	1	2	-	-	-	-	-	2	1	2	2	-
CO5	Apply various Classification techniques and different types of classifiers	-	2	1	-	3	2	-	-	2	1	-	2	-	2	2	-
CO6	Analyze and adapt existing clustering techniquesin various applications.	-	2	1	2	3	2	-	-	2	1	-	2	-	-	-	-

	PO	Level	Justification
CO1	PO12	maps moderately	The basic knowledge of computer science will help the students to understand Data Mining Applications and need the Data Warehouse and its applications
CO2	PO1 PO2 PO12	Maps moderately	The knowledge of Data Models helps students to identify real world requirements and represent data in multiple dimensions and support for effective data visualization.
	PO5	Maps Strongly	The knowledge of Data Modeling helps to understand different multidimensional views like rotate, slicie-horizontal/vertical
CO3	PO1 PO2	Maps Slightly	The understanding of Data Preprocessing operations helps students to analyze different types of data available in the real world
	PO12	Maps Moderately	The knowledge of data preprocessing techniques help students to build the efficient data mining models
CO4	PO2 PO4 PO6 PO12	Maps moderately	The knowledge of Association Rule mining helps students to analysis market basket data and find useful associations such that it enhances the decision-making in business organizations
	PO1 PO3 PO5	Maps slightly	Explore different Association Rule mining evaluation techniques and applications such that it used to compare and develop efficient models.
CO5	PO2 PO6 PO7 PO12		It helps to understand different application of classifier algorithms
	PO5	Maps strongly	The evaluation of classification models using outcomes of Confusion Matrix
	PO3 PO10	Maps slightly	Helps to understand domain specific applications of classifier models like disease classification, document classification etc.
CO6	PO2 PO4 PO6 PO9 PO12	Maps Moderately	The basics of Data Clustering helps to analyze real world data and identification of domain specific clusters
	PO3 PO10	Maps Slightly	The understanding of clustering algorithms helps to students to understand the patterns exhibited by real world data
	PO5	Maps Strongly	Analyze various cluster models and gain the knowledge different similarity and dissimilarity measures

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS653-OPERATION RESEARCH

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Understand how to translate a real-world problem, into a mathematical formulation	3	3	1										3	2		
CO2	Identify and apply optimization techniques forvarious problems	2	2	2	2									2	2	2	
CO3	Model the given problem as transportationproblem and solve.	2	2	2										2	2		
CO4	Apply game theory for decision support system	2	2	2	1									2	2	2	
CO5	Analyze and apply branch-and-bound andheuristic methods to solve general integerproblems	2	2	2	2									2	2	2	
CO6	Incorporate the principles of assignment of jobsand find the optimal solution	2	2	2										2	2		

CO1	**PO**	**Level**	**Justification**
	PO1 PO2	maps Highly	The knowledge of mathematical principles and basics of computer science will help the students to apply the same in translating the real world problems to mathematical models
	PO3	Maps slightly	The knowledge of translating the real world problems into mathematical models will help the students to design anddevelop some solutions for the society and that will help them in lifelong learning by using some simulation tools
CO2	PO1 PO2 PO3 PO4	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same in understanding the concepts optimization techniques for various problems
CO3	PO1 PO2 PO3	Maps Moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same in transportation problems solving
CO4	PO1 PO2 PO3	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same in game theory for decision support system
	PO4	Maps slightly	Transportation problems solving may be exploited by using some simulation tools and the student can use this technique for solving the real world problems. This will help them for life long learning
CO5	PO1 PO2 PO3 PO4	maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same in heuristic methods
CO6	PO1 PO2 PO3	maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same in assignment problems solving

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS664-PYTHON APPLICATION PROGRAMMING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Examine python syntax and semantics and be fluent in using flow control andfunctions	1	2			3							1	2	2	3	
CO2	Demonstrate proficiency in handlingstrings and file systems in python	1	2	2	2	3							1	1	3	2	
CO3	Create and run python programs using core data structures like lists, dictionaries , tuples, and sets and use ofRes	2	2	3	2	3							2	1	3	2	
CO4	Interpret and apply the concepts of OOP	2	1	3	-	3						3	2	1	3	2	
CO5	Implement exemplary applications related to network programming andweb services	2	2	3	2	3						3	2	1	3	2	
CO6	Implement database applications inpython	2	2	3	2	3						3	2	1	3	2	

CO1	**PO**	**Level**	**Justification**
	PO5	Maps Substantially	Python is used in most of the applications
	PO2	Maps Moderately	Python is used as a tool to solve modern day problems.
	PO1 PO12	maps Slightly	Python can be used for other courses and applications.
CO2	PO5	Maps Substantially	String manipulation functions of python are used in most modern day front end tools.
	PO2 PO3 PO4	Maps Moderately	File manipulation functions are used in developing solutions.
	PO1 PO12	maps Slightly	File and string handling functions are used in other applications.
CO3	PO3 PO5	Maps Substantially	Tuples, list and dictionary are used in NO SQL DB
	PO1 PO2 PO4 PO12	Maps Moderately	In order to design the DS properly, analysis of requirement and problem solving technique is required.
CO4	PO3 PO5 PO11	Maps Substantially	Object oriented concepts can be applied for most of the applications.
	PO1 PO12	Maps Moderately	OOPS is used in other domains also.
	PO2	maps Slightly	OOPS can render solutions for engineering problems.
CO5	PO3 PO5 PO11	Maps Substantially	Networking aspects are used in most of the modern front end tools.
	PO1 PO2 PO4 PO12	Maps Moderately	Socket programming requires engineering knowledge and is used in other domains.
CO6	PO3 PO5 PO11	Maps Substantially	SQLITE is a DBMS package which can be used in modern applications.
	PO1 PO2 PO4 PO12	Maps Moderately	DDL and DML statements of SQLITE are used of solving real time problems.

CO1	**PSO**	**Level**	**Justification**
	PSO1 PSO2	Maps Moderately	Python is used in most of the applications
	PSO3	Maps Slightly	Python is used as a tool to solve modern day problems.
CO2	PSO1	maps Slightly	String manipulation functions of python are used in most modern day front end tools.
	PSO2	Maps Substantially	File manipulation functions are used in developing solutions.
	PSO3	Maps Moderately	File and string handling functions are used in other applications.
CO3	PSO1	maps Slightly	Tuples, list and dictionary are used in NO SQL DB
	PSO2	Maps Substantially	In order to design the DS properly, analysis of requirement and problem solving technique is required.
	PSO3	Maps Moderately	Data structure is the theme of modern day software.
CO4	PSO1	maps Slightly	Object oriented concepts can be applied for most of the applications.
	PSO2	Maps Substantially	OOPS is used in other domains also.
	PSO3	Maps Moderately	OOPS can render solutions for engineering problems.
CO5	PSO1	maps Slightly	Networking aspects are used in most of the modern front end tools.
	PSO2	Maps Substantially	Socket programming requires engineering knowledge and is used in other domains.
	PSO3	Maps Moderately	Networking concepts are used in other domains also.
CO6	PSO1	maps Slightly	SQLITE is a DBMS package which can be used in modern applications.
	PSO2	Maps Substantially	DDL and DML statements of SQLITE are used of solving real time problems.
	PSO3	Maps Moderately	DBMS concepts are used in other disciplines.

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CSL67-SS & OS LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Implement and demonstrate Lexer's and Parser's.	3	1	3	2	3	-	-	-	-	-	-	1	-	-	1	-
CO2	Design and implement variousparsing techniques.	3	3	3	2	3	-	-	-	-	-	1	1	2	1	2	-
CO3	Design and implement a codegenerator	3	3	3	2	1	-	-	-	-	-	1	1	3	1	3	-
CO4	Evaluate different process scheduling algorithms in operatingSystem.	3	2	3	2	1	-	-	-	-	-	-	1	2	1	1	-
CO5	Design and implement a solution for deadlocks in operating system	3	2	3	2	1	-	-	-	-	-	-	1	1	1	1	-
CO6	Evaluate different algorithms required for management of pageallocation techniques	3	2	3	2	1	-	-	-	-	-	-	1	1	1	2	-

CO1	**PO**	**Level**	**Justification**
	PO1 PO3 PO5	Maps Strongly	The knowledge of mathematical principles and basics, design and development of solutions as well as the tools available for the Lexers are strongly needed
	PO4	Maps moderately	The investigation of the given Lex problem is needed moderately
	PO2 PO12	Maps slightly	The Lex knowledge may slightly help the students in their problem analysis as well as their higher studies
CO2	PO1 PO2 PO3 PO5	Maps Strongly	Good Engineering knowledge, identification of the problem, designing the solutions, preferring the modern toolusage is strongly recommended for the parsing technique
	PO4	Maps moderately	The student need to conduct an moderate investigation while designing various parsing technique
	PO11 PO12	Maps slightly	Various parsing techniques may help the students slightly in their multidisciplinary environment as well as their higher studies
CO3	PO1 PO2 PO3	Maps Strongly	To implement the code generator the student should have a strong fundamental knowledge, problem analysis and development of solutions
	PO4	Maps moderately	The code generator needs an moderate investigation of complex problems
	PO5 PO11 PO12	Maps slightly	Code generators require a slight knowledge of modern tools, may help slightly in their working with a multidisciplinary team as well as in their preparation for long term learning
CO4	PO1 PO3	Maps Strongly	The knowledge of mathematical principles and basics of computer science will help the students to apply and exploit parallel processing and analyse the processor performance.
	PO2 PO4	Maps moderately	Designing Parallel Processing Techniques requires strong analysis skills and longevity of learning.
	PO5 PO12	Maps slightly	Development and performance analysis of various Process Scheduling algorithms requires longevity of learning.
CO5	PO1 PO3	Maps Strongly	The knowledge of mathematical principles and basics of computer science will help the students to buildconcurrency in application.
	PO2 PO4	Maps moderately	Dead lock management needs analysis and research methodologies to solve complex issues of real world.
	PO5 PO12	Maps slightly	Dead lock Management Skills should be adapted with the new changing environment and requires lifelong learning.
CO6	PO1 PO3	Maps Strongly	The knowledge of mathematical principles and basics of computer science will help the students to design andbuild various resource management techniques.
	PO2 PO4	Maps moderately	Determine the best memory management technique for different operating systems needs analysis of complex problem solving skills.
	PO5 PO12	Maps slightly	Resource Management Skills should be adapted with the new changing environment and requires lifelong learning.

CO1	**PSO**	**Level**	**Justification**
	PSO3	Maps slightly	The Lex knowledge may slightly help the students in their problem analysis as well as their higher studies
CO2	PSO1 PSO3	Maps moderately	Good Engineering knowledge, identification of the problem, designing the solutions, preferring the modern tool usage is strongly recommended for the parsing technique as well as their higher studies
	PSO2	Maps slightly	Various parsing techniques may help the students slightly in their multidisciplinary environment
CO3	PSO1 PSO3	Maps Strongly	To implement the code generator the student should have a strong fundamental knowledge, problem analysis and development of solutions
	PS02	Maps moderately	Code generators require a slight knowledge of modern tools, may help slightly in their working with a multidisciplinary team as well as in their preparation for long term learning
CO4	PSO1	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply and exploit parallel processing and analyse the processor performance and longevity of learning.
	PSO2 PSO3	Maps slightly	Development of any new application in multidisciplinary environment requires fundamental knowledge of functionalities of OS
CO5	PSO1 PSO2 PSO3	Maps slightly	The knowledge of mathematical principles and basics of computer science will help the students to build concurrency in different application platforms and should be adapted with the new changing environment for sustainability.
CO6	PSO1 PSO2	Maps slightly	The knowledge of mathematical principles and basics of computer science will help the students to design and build various resource management techniques.
	PSO3	Maps moderately	Determine the best memory management technique for different operating systems needs analysis of complex problem solving skills and requires lifelong learning.

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CSL68-CG&V Lab WITH MINI PROJECT

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Apply the concepts of computergraphics.	2	1	2	-	2	-	-	-	-	-	-	2	2	1	1	-
CO2	Implement computer graphics applications using OpenGL.	2	2	3	2	2	-	-	-	-	-	-	2	2	2	1	-
CO3	Animate real world scenarios usingOpenGL	2	2	3	2	2	1	1	-	3	3	2	2	2	2	2	-
CO4	Rasterize 2D primitives usingOpenGL	2	3	2	1	2	-	-	-	-	-	-	2	2	2	1	-
CO5	Implement different clippingalgorithms.	2	2	2	1	2	-	-	-	-	-	-	2	3	2	1	-
CO6	Transform 2D and 3D geometricobjects.	3	3	2	1	2	-	-	-	2	-	-	2	2	2	1	

CO1	**PO**	**Level**	**Justification**
	PO1 PO3 PO5 PO12	Maps moderately	The knowledge of mathematics will help to draw graphics primitives (line, rectangle, circle etc). and write simple graphics programs. Basic knowledge can be used for life long learning
	PO2	Maps slightly	Basic mathematical equations (eg equation of line,circle,ellipse) are required to understands graphics.
CO2	PO3	Maps Substantially	The knowledge of Opengl will help students to design and develop programs using builtin primitives.
	PO1 PO2 PO4 PO5 PO12	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to independently write opengl programs.
CO3	PO6 PO7	Maps Slightly	Students will be able to code for pictorial representation of environmental canditions.
	PO1 PO2 PO4 PO5 PO11 PO12	Maps moderately	Students will be able to create 2D and 3D objects.
	PO3 P09 P10	Maps Substantially	Students can develop mini-projects using opengl concepts and write the report for their project and also present their projects, which will help them to improve communication skills.
CO4	PO4	Maps slightly	The knowledge of mathematical principles and basics of computer graphics will help students to investigate on different drawing methodology.
	PO1 PO3 PO5 PO12	Maps moderately	Using modern tools and framework (Visual Studio) students will be able draw 2D objects.
	PO2	Maps Substantially	Using different algorithms students will be able to analyse how pixels are plotted to draw objects on display window.
CO5	PO1 PO2 PO3 PO5 PO12	maps moderately	The knowledge of mathematical principles and different clipping algorithms will help students to understand different clipping techniques (Point clipping, line clipping, text clipping, curve clipping)
	PO4	Maps slightly	Students can analyze how clipping is applied for any type of figures, text. and curve
CO6	PO1 PO2	Maps Substantially	Using the basics of mathematics will help us to apply geometric transformations like translation, rotation, scaling, shear, reflection.
	PO3 PO5 PO9 PO12	maps moderately	Using geometric transformations students will be able to design any 2d and 3d objects and create animated projects (such as games, sceneries)
	PO4	Maps slightly	Students will be able to analyze and find different methodology

17CS71- Web Technology and its Applications

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Adapt HTML and CSS syntax and semantics to build web pages.	2	-	2	-	2	-	-	-	1	-	1	2	2	2	3	-
CO2	Construct and visually format tables and forms using HTML and CSS	2	-	2	-	2	-	-	-	1	-	1	2	2	2	2	-
CO3	Develop Client-Side Scripts using JavaScript	2	2	3	1	3	-	-	-	2	1	2	3	3	3	3	-
CO4	Develop Server-Side Scripts using PHP	2	1	2	1	3		-	-	2	1	2	3	3	3	3	-
CO5	Appraise the principles of object oriented development using PHP	2	1	3	1	3	-	-	-	2	2	2	3	3	2	3	2
CO6	Inspect JavaScript frameworks jQuery and Backbone	2	1	3	1	3	-	-	-	3	2	2	3	3	3	3	-

CO1	**PO**	**Level**	**Justification**
	PO1 PO3PO5	maps moderately	The basic knowledge of computer science will help the students to understand Structure , Semantic of markup languages
	PO9 PO11	Maps slightly	The basic knowledge of markup languages will help the students to build own web page.
CO2	PO1 PO3 PO5 PO12	Maps moderately	The basic knowledge of computer science will help the students to understand usage of Cascading Style Sheets
	PO9 PO11	Maps slightly	The knowledge of Cascading Style Sheets helps the students create their own web page.
CO3	PO1 PO5 PO9 PO11	Maps moderately	The basic knowledge of computer science will help the students to understand concept of different scripting languages which helps to validate information.
	PO3 PO5 PO12	Maps Strongly	Understand Java Scripts to verify and validate form inputs Interaction with client browsers
	PO4 PO10	Maps slightly	Interaction with real world-to collect data
CO4	PO1 PO3 PO9 PO11	Maps moderately	Interaction with server side technologies like PHP supports data processing and storage Dynamic Response generation
	PO2 PO4 PO10	Maps slightly	Interaction & Data Collection from clients and processing at server side.
	PO5 PO12	Maps Strongly	Develop dynamic client - server applications
CO5	PO3 PO5 P012	Maps Highly	The knowledge of server side S c r i p t i n g language will help the students to understand client server application which will enhance the students to design different web pages.
	PO1 PO9 PO10 PO11	maps moderately	The knowledge of computer science will help the students to understand client/server design.
	PO2 PO4	Maps slightly	The knowledge so gained will form the basis for interpreting the client server design concepts.
CO6	PO3 PO5 PO9 PO12	Maps Highly	The knowledge of jQuery and Backbone frameworks will help the students to design and develop web sites.
	PO1 PO10 PO11	Maps moderately	The knowledge of computer science will help the students to understand fundamentals of framework.
	PO2 PO4	Maps slightly	The basic knowledge of will enable the students to analyze different frameworks.

CO1	**PSO**	**Level**	**Justification**
	PSO1	maps moderately	The basic knowledge of computer science and its fundamentals will help the students to understand Structure , Semantic of markup languages will lay down solid foundation for Engineering
	PSO3	Maps slightly	The basic knowledge of markup languages will help the students to help them to build web pages in future.
CO2	PSO1 PSO2 PSO3	Maps slightly	The basic knowledge of computer science will help the students to understand usage of Cascading Style Sheets which will help to build the Carrier in software industry.
CO3	PSO1 PSO2 PSO3	Maps moderately	The basic knowledge of computer science will help the students to understand concept of different scripting languages which helps to design and validate information in industrial applications
CO4	PSO3	Maps moderately	The knowledge of Document object model (DOM) will help the students to design dynamic web pages which will be useful in software industry..
	PSO1 PSO2	Maps slightly	The knowledge of Regular Expression will help the Students analyze information dynamically which will help the students to learn computer fundamentals.
CO5	PSO3	Maps Highly	The knowledge of Scripting languages will help the students to understand client server application which will enhance the students to design their own web pages.
	PSO1 PSO2 PSO4	maps moderately	The knowledge of computer science will help the students to understand client/server design which will ensure the authenticate and confidentiality.
CO6	PSO2 PSO3	maps moderately	The knowledge of computer science will help the students to understand fundamentals of framework which will be used for the benefits of society.

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS72-ADVANCED COMPUTER ARCHITECTURE

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Understand the concepts of parallel computing	2	-	-	-	-	-	-	-	-	-	-	1	2	-	1	-
CO2	Demonstrate the concepts of hardware technologies	2	-	-	-	-	-	-	-	-	-	-	1	2	-	1	-
CO3	Explore bus, cache, shared memory with pipelining and super scalar techniques	2	1	-	-	-	-	-	-	-	-	-	1	2	-	1	-
CO4	Classify parallel architecture	2	1	1	-	-	-	-	-	-	-	-	1	2	-	1	-
CO5	Assess Scalable architecture	2	1	1	-	-	-	-	-	-	-	-	1	2	-	1	-
CO6	Investigate parallel programming concept	2	1	1	-	-	-	-	-	-	-	-	1	2	-	1	-

CO1	PO	Level	Justification
	PO1	maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and identify various computer architecture and ,analyse its performance . Understand the recent developments and life-longlearning.
	PO12	Maps slightly	Performance anlaysis helps the students to gain the research based knowledge
CO2	PO1	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same inunderstanding the concepts of hardware technologies
	PO12	Maps slightly	Students explore existing architecture of processor, which creates an opportunity to design a new architecture
CO3	PO1	Maps slightly	The knowledge of mathematical principles and basics of computer science will help the students to apply the same andexploit different super scalar techniques
	PO2 PO12	Maps moderately	Challenges and opportunities of shared memory and cache techniques has been analyzed.
CO4	PO1	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same andexploit different parallel architecture
	PO2 PO3 PO12	Maps slightly	Parallel architecture classification study needs some knowledge of problem analysis and design alternatives. This willhelp the students to going for their higher studies in design and development areas
CO5	PO1	maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same inclassification of Scalable architecture
	PO2 PO3 PO12	Maps slightly	Scalable architecture classification study needs some knowledge of problem analysis and design alternatives. This willhelp the students to going for their higher studies in design and development areas
CO6	PO1	maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same inparallel programming concepts
	PO2 PO3 PO12	Maps slightly	Parallel programming concept needs some knowledge of problem analysis and design alternatives. This will help thestudents to going for their higher studies in design and development areas

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS73-Machine Learning

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Understand machine learning and problems relevant to machine learning	2	1	1									1	2		2	2
CO2	Analyze concept learning and decision trees.	2	2	1	1	1				1			2	2	1	2	2
CO3	Apply artificial neural networks in machine learning.	2	2	1	2	1				1			2	2	1	2	2
CO4	Interpret and realize Bayesian methods	2	2	1	2	1				1			2	2	1	2	2
CO5	Investigate instance based learning	2	2	1	2	1				1			2	2	1	2	2
CO6	Evaluate hypothesis and examine reinforcement learning. .	2	2	1	2	1				1			2	2	1	2	2

CO1	PO	Level	Justification
	PO1,	maps moderately	Knowledge of various machine learning approaches involves solving complex engineering problems.
	PO2, PO3, PO12	Maps slightly	Principles of mathematics and engineering sciences are used in various aspects of machine learning approaches. Using the knowledge of supervised learning concepts, we can design and develop solutions for complex engineering problems. Expertise developed, which will enable the student to become a productive member of a design team.
CO2	PO1, PO2, PO12	Maps moderately	Comparative study of different dimensionality reduction techniques involves solving complex engineering problems. Principles of mathematics and engineering sciences are used in various aspects of dimensionality reduction techniques.
	PO3 PO4 PO5 PO9	Maps slightly	Knowledge of dimensionality reduction techniques can be used to design and develop solutions for complex engineering problems.
CO3	PO1, PO2, PO4. PO12	Maps moderately	Knowledge of theoretical foundations of decision trees involves solving complex engineering problems. Theoretical foundations of decision trees to identify best split and Bayesian classifier to label data points .knowledge can be used to design and conduct experiments to provide valid conclusions
	PO3PO5 PO9	Maps slightly	Expertise developed, which will enable the student to become a productive member of a design team.
CO4	PO1,PO2, PO4, PO12	Maps maderately	Knowledge of classifier models applications helps in solving complex engineering problems.
	PO3 PO5 PO9	Maps slightly	Knowledge of classifier models can be used to design and develop solutions for complex engineering problems
CO5	PO1, PO2, PO4, PO12	Maps moderately	State sequence identification and sequence emission probability evaluation skills can be used to design and conduct experiments to provide valid conclusions.
	PO3 PO5PO9	Maps slightly	Sequence emission probability evaluation knowledge can be used to design and develop solutions for complex engineering problems
CO6	PO1,PO2, PO4,PO12	Maps moderately	Knowledge of clustering algorithms involves solving complex engineering problems.
	PO3 PO5 PO9	Maps slightly	Clustering algorithms can be used to design and develop solutions for complex engineering problems

CO	PSO	LEVEL	Justification
CO1	PSO1, PSO3, PSO4	Maps moderately	Various learning approaches Acquire skills to design, analyse and develop algorithms and implement themusing high-level programming languages.
	PS02	Maps slightly	Knowledge of supervised learning concepts contribute skills in computing and knowledge engineering domain.
CO2	PSO1, PSO3, PSO4	Maps moderately	Knowledge of different dimensionality reduction techniques Acquire skills to design, analyse and develop algorithms and implement them using high level programming languages.
	PSO2	Maps slightly	Different dimensionality reduction techniques concepts contribute skills in computing and knowledge engineering domain.
CO3	PSO1, PSO3, PSO4	Maps moderately	Theoretical foundations of decision trees to identify best split and Bayesian classifier Acquire skills to design,analyse and develop algorithms and implement them using high-level programming languages.
	PSO2	Maps slightly	Theoretical foundations of decision trees and Bayesian classifier contribute skills in computing and knowledge engineering domain.
CO4	PSO1, PSO3, PSO4	Maps moderately	Study of classifier model working acquire skills to design, analyse and develop algorithms and implementthem using high-level programming languages
	PSO2	Maps slightly	Identification of classifier model application area contribute skills in computing and knowledge engineeringdomain.
CO5	PSO1, PSO3, PSO4	Maps moderately	Design and implement a parallel machine learning algorithm on top of the Hadoop framework for a research problem.
	PSO2	Maps slightly	Machine learning draws on concepts and results from many Engineering fields.
CO6	PSO1, PSO3, PSO4	Maps moderately	Machine Learning algorithms applied for the real world problem like Games, Robot etc. Machine Learning problem apply for Research problem.
	PSO2	Maps slightly	Machine Learning algorithm uses different Engineering fields concept.

17CS742- CLOUD COMPUTING AND ITS APPLICATION

	Course Outcomes	Program Outcomes											Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Understand the concept of cloud computing, virtualization and classifyservices of cloud computing	3	3	2			3							3	3		
CO2	Illustrate architecture and programming incloud		3		2												
CO3	Define the platforms for development of cloud applications and list the applicationof cloud	2		2								2			1		
CO4	Develop Server-Side Scripts using PHP Analyze various cloud programming models and apply them to solve problems on the cloud	2	2	3									2	2			
CO5	Understand the core issues of cloud computing such as security, privacy, andinteroperability						3	1									
CO6	Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS,public cloud, private cloud, hybrid cloud, etc.		2	2								2			2	1	1

CO1	PO	Level	Justification
	PO1 PO2 PO6	maps Strongly	The basic knowledge of computer science will help the students Understand the concept of cloud computing, virtualization and classify services of cloud computing, types of cloud computing

	PO9 PO11	Maps slightly	The basic knowledge of virtualization and classify services of cloud computing will help the students to build their own cloud.
CO2	PO2	Maps Strongly	The basic knowledge of computer science will help the students to understand and Illustrate architecture and programming in cloud
	PO4	Maps moderately	The knowledge of map reducing techniques in cloud helps the students to programming in cloud .
CO3	PO1 PO3 PO11	Maps moderately	The basic knowledge of computer science will help the students to Define the platforms for development of cloud applications and list theapplication of cloud
CO4	PO1 PO2 PO12	Maps moderately	Develop Server-Side Scripts using PHP
	PO3	Maps Strongly	Analyze various cloud programming models and apply them to solve problems
CO5	PO6	Maps Strongly	Understand the core issues of cloud computing such as security, privacy, and interoperability
	PO7	maps slightly	Understand the core issues of cloud computing such as security, privacy, and interoperability.
CO6	PO2 PO3 PO11	Maps moderately	Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid

	PSO	**Level**	**Justification**
CO1	PSO1	maps strongly	The basic knowledge of computer science and its fundamentals will help the students to understand Understand the concept of cloud computing, virtualization and classify services of cloud computing
	PSO2	Maps strongly	The basic knowledge of virtualization and classify services of cloud computing will help the students to build their own cloud in future.
CO3	PSO2	Maps moderately	The basic knowledge of computer science will help the students to Define the platforms for development of cloud applications and list the application of cloud
CO4	PSO1	Maps moderately	Analyze various cloud programming models and apply them to solve problems
CO6	PSO2 PSO3 PSO4	maps moderately Maps slightly	Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS744-UNIX SYSTEM PROGRAMMING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Distinguish among ANSI C & POSIXstandards	2		1	1								2	1		2	-
CO2	Illustrate UNIX Kernel support for files	1		1	2	1							2	1		2	
CO3	Understand Kernel support for process	1		2	1								2	2		2	
CO4	Interpret Process Accounting, processUID ,Terminal logins, network logins	1		2	1								2	2		2	
CO5	Analyze process control, Deamon characteristics, coding rules and error logging	1		1	1	1							1	2		1	
CO6	To build an application/service over aUNIX system	1		1	1	1				1		1	3	2	3	2	1

	PO	Level	Justification
CO1	PO1	Maps Moderately	Fundamental knowledge of ANSI C and POSIX standards are required.
	PO3	Maps Slightly	Understanding complex OS operations are understood by understanding systems calls in C
	PO4	Maps Slightly	Interpretation of data being passed in OS between process, terminals and different networks
	PO12	Maps Moderately	Understanding basic working of OS and future system level applications.
CO2	PO1	Maps Slightly	Fundamental understanding of files and UNIX representation of files.
	PO3	Maps Slightly	Complex OS operations related to files like soft link and hard link are understood in basic manner.
	PO4	Maps Moderately	Creating IPC and using UID to start and kill the process helps in understanding the tasks of OS
	PO5	Maps Slightly	Modern tools are used to identify file id, uid
	PO12	Maps Moderately	Files are integral part of all types of programs

CO3	PO1	Maps Slightly	Understanding the fundamentals of process creation, process deletion and process management
	PO3	Maps Moderately	Different types of application requires the thorough understanding of process
	PO4	Maps Slightly	Interpretation of P-table that holds all the necessary information related to process
	PO12	Maps Moderately	Communication and usage of system calls are integral part of programming life cycle
CO4	PO1	Maps Slightly	Understanding how login's are created and used
	PO3	Maps Moderately	Client-Server model needs the knowledge of network login creation
	PO4	Maps Slightly	Complex system program such as device drivers and other system programs require knowledge of login
	PO12	Maps Moderately	Different types of application requires the thorough understanding of different types of login
CO5	PO1	Maps Slightly	Understanding the basics of daemon process formation
	PO3	Maps Slightly	Complexity involved in creating daemon process and maintenance of the same by OS routines
	PO4	Maps Slightly	Coding rules must be adopted in research based and application programs
	PO5	Maps Slightly	Modern tools can be used to analyse daemon process formation and maintenance
	PO12	Maps Slightly	Inculcating the concepts of daemon process and coding standards and error debugging is a life time process
CO6	PO1	Maps Slightly	Understanding UNIX OS structure and building a simple application over it.
	PO3	Maps Slightly	Application programs require extensive usage of system calls
	PO4	Maps Slightly	Interpretation of data related to process, in terms of their storage, usage and updation.
	PO5	Maps Slightly	Modern tools can be used to analyse system call working
	PO9	Maps Slightly	System call implementation needs integration of several programmers
	PO12	Maps Slightly	Inculcating the concepts of system calls and coding standards and error debugging is a life time process
	PSO	**Level**	**Justification**
CO1	PSO1	Maps Slightly	A strong foundation of basics of OS will be understood.
	PSO3	Maps Moderately	Basic understanding will help graduates to acquire necessary skills to perform as an individual
CO2	PSO1	Maps Slightly	Fundamental understanding of files and UNIX representation of files.
	PSO3	Maps Moderately	Complex OS operations related to files like soft link and hard link are understood in basic manner.
CO3	PSO1	Maps Moderately	Understanding the fundamentals of process creation, process deletion and process management.
	PSO3	Maps Moderately	Different types of application requires the thorough understanding of process
CO4	PSO1	Maps Moderately	Understanding how logins are created and used
	PSO3	Maps Moderately	Client-Server model needs the knowledge of network login creation
CO5	PSO1	Maps Moderately	Understanding the basics of daemon process formation
	PSO3	Maps Slightly	Complexity involved in creating daemon process and maintenance of the same by OS routines
CO6	PSO1	Maps Moderately	Understanding UNIX OS structure and building a simple application over it.
	PSO2	Maps Substantially	Application programs require extensive usage of system calls
	PSO3	Maps Moderately	Interpretation of data related to process, in terms of their storage, usage and updation.
	PSO4	Maps Slightly	Modern tools can be used to analyse system call working

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CS754 -SAN

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Examine the Storage Area Networks characteristics, components and storage architectures	1											1	1		1	1
CO2	Exemplify the concept of RAID and their suitability for different application environments	1	2	1	1								1	1		1	1
CO3	Analyze file sharing operations on NAS and IP-SAN of the different networks	1	1										1	1		1	1
CO4	Depict the working of Storage Virtualization on Various levels of Storage	1											1	1		1	1
CO5	Illustrate the concepts of business continuity and disaster recovery in a storage infrastructure	1											1	1		1	1
CO6	Demonstrate the Knowledge of Securing the local replication in Storage Infrastructure and Cloud	1											1	1		1	1

CO	PO	Mapping level	Justification
CO1	Slightly	Slightly	As the students are required to focus on the fundamentals of Storage Area Networks characteristics, components and storage architectures.
CO2	PO2	Moderately	Students can gain concept of RAID and their suitability for different application environments gives the orientation towards problem solving capability
	PO1 PO3 PO4	Slightly	Maps slightly to the Knowledge on RAID and the different application environments as it leads towards enhancing the basic fundamental problem solving capability.
CO3	PO1 PO2 PO12	Slightly	Analysis of file sharing operations on NAS and IP-SAN of the different networks helps them to apply the engineering knowledge which leads to identify the problem statement.
CO4	PO1 PO12	Slightly	Students can have basic knowledge on the working of Storage Virtualization on Various levels of Storage at this level which will be helpful to apply gained knowledge in future
CO5	PO1 PO12	Slightly	As the Students are able to only Illustrate the concepts of business continuity and disaster recovery in a storage infrastructure it maps slightly.
CO6	PO1 PO12	Slightly	Students can Demonstrate the Knowledge of Securing the local replication in Storage Infrastructure and Cloud.

CO	PSO	Mapping level	Justification
CO1	PSO1 PSO3 PSO4	Slightly	Graduates will use the solid foundation in the principles of computer science to understand Storage Area Networks characteristics, components andstorage architectures during their career in software industry or while pursuing higher studies.
CO2	PSO1 PSO3 PSO4	Slightly	Graduates will use the solid foundation in the principles of computer science to interpret the concept of RAID and their suitability for different application environments during their career in software industry or while pursuing higher studies.
CO3	PSO1 PSO3 PSO4	Slightly	Graduates will use the solid foundation in the principles of computer science to analyze file sharing operations on NAS and IP-SAN of the different networks during their career in software industry or while pursuing higher studies.
CO4	PSO1 PSO3 PSO4	Slightly	Graduates will use the solid foundation in the principles of computer science to develop the capability to analyze working of Storage Virtualization on Various levels of Storage during their career in software industry or while pursuing higher studies.
CO5	PSO1 PSO3 PSO4	Slightly	Graduates will use the solid foundation in the principles of computer science Illustrate the concepts of business continuity and disaster recovery in a storage infrastructure during their career in software industry or while pursuing higher studies.
CO6	PSO1 PSO3 PSO4	Slightly	Graduates will use the solid foundation in the principles of computer science to Demonstrate the Knowledge of Securing the local replicationin Storage Infrastructure and Cloud during their career in software industry or while pursuing higher studies.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CSL76-Machine Learning Laboratory

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Implement and demonstrate the concept learning algorithms (FIND-S, Candidate-Elimination)	2	2	2									2	2	1	2	
CO2	Demonstrate the working of the decision tree and apply this knowledge to classify a new sample. (ID3)	2	2	2		1							2	2	1	2	
CO3	Build an Artificial Neural Network by implementing the Back propagation algorithm.	2	2	2		1							2	2	1	2	
CO4	Apply the naïve Bayesian classification methods and build Bayesian network.	2	2	2	2	1							2	2	1	2	
CO5	Implement EM algorithm, k-means and Compare their results.	2	2	2	2	1							2	2	1	2	
CO6	Investigate instance based and regression algorithms.	2	2	2		1							2	2	1	2	

CO1	**PO**	**Level**	**Justification**
	PO1, PO2, PO3, PO12	maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the samein life long learning. Life long learning is involved to bring technological change.
CO2	PO1,PO2, PO3, PO12	Maps moderately	To develop the decision tree, engineering knowledge is needed to analyze the problem and to develop the solution.Life long learning is involved to bring technological change.
	PO5	Maps slightly	Tools are used to generate the tree.
CO3	PO1,PO2, PO3,PO1 2	Maps substantially	Students uses engineering knowledge and mathematical principles to analyze and to develop the solutions for Artificial Neural Networks and apply the same in life long learning to bring technological changes.
	PO5	Maps slightly	Conduct investigation on complex problems by making use of tools.
CO4	PO1,PO2, PO3,PO4, PO12	Maps substantially	To learn Bayesian Networks, engineering knowledge is required to analyze and develop solutions. Life long learning is involved to bring technological change.
	PO5	Maps slightly	Some libraries in Python are used to develop graphs..
CO5	PO1, PO2, PO3, PO4, PO12	Maps moderately	Gained knowledge on computational problems like K-Means and EM Algorithm. Developed solution for the same.Also documentation is maintained.
	PO5	Maps slightly	Solution is developed using Python Idle and developed solution is useful to society.
CO6	PO1,PO2, PO3,PO12	Maps moderately	After analyzing the algorithms, students are able to develop the solution and can conduct further investigation for complex problems. Life long learning is involved to choose the algorithmic techniques inorder to improve the efficiency and to bring some technological changes.
	PO5	Maps slightly	Appropriate techniques are used to develop the solution.

CO	PSO	LEVEL	Justification
CO1	PSO1 PSO3	Maps moderately	The graduates of the Program will have solid foundation in the principles and practices of computer science, including mathematics, science and basic engineering to solve simple computational problems. Through thisgraduates will be prepared for their careers in software industry.
	PS02	Maps slightly	Solution is developed using Python Idle and can be used in multi disciplinary teams.
CO2	PSO1 PSO3	Maps substantially	Enables to gain knowledge on Decision Trees.
	PSO2	Maps slightly	Knowledge on Decision Trees will help the students to work in multi disciplinary teams.
CO3	PSO1 PSO3	Maps substantially	Students will get solid foundation on graph/network based problems.
	PSO2	Maps slightly	All these solutions are developed in Python Idle.
CO4	PSO1 PSO3	Maps moderately	Graduates will be prepared for the careers, and to gain professional knowledge.
	PSO3	Maps slightly	Combinatorial problems solutions are developed using Pyhton Idle.
CO5	PSO1 PSO3	Maps moderately	Knowledge on computational problems will give strong foundation on mathematical principles. And also higher studies can be made on this.
	PSO2	Maps slightly	Computational problems are developed using Python Idle.
CO6	PSO1 PSO3	Maps moderately	Solutions are given to instance based problems. To do this, strong mathematical background is required. Onceanalysis is done, solutions are developed which would be helpful to start careers in the software industry.
	PSO2	Maps slightly	Instance based problems knowledge can be applied in multi disciplinary teams.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

17CSL77 -WEB TECHNOLOGY Laboratory with Mini Project

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Develop web pages using HTML5 and CSS.	2											1	2		1	2
CO2	Design dynamic web pages using JavaScript	2	1	2		1				1		1	2	2		1	2
CO3	Create interactive web applications using PHP.	2	2	2	1	2				1		1	2	2		2	1
CO4	Explore different Web Services, Internet Tools and Database	2	1	2	1	2				1	1	1	2	2	1	2	2
CO5	Design and Develop Web project	2	1	2		2				1	2	1	2	2	1	2	2
CO6	Evaluate and Document Web project	2	1	2		3					2		2	1	1	2	2

	PO	Level	Justification
CO1	PO1	maps moderately	Students will be able to apply the knowledge of engineering fundamentals to understand the elements and attributes of web pages.
	PO12	Maps slightly	Help students to recognize the need for web pages in front-end development.
CO2	PO1 PO3 PO12	Maps moderately	Students can apply the knowledge of engineering fundamentals to design front-end using HTML and CSS that meet the specified needs. Also help them to recognize the need for CSS to engage in independent and life-long learning.
	PO2 PO5 PO9 PO11	Maps slightly	The knowledge of CSS and HTML5 help students to analyze engineering problems using modern engineering and IT tools, this also helps to be a member or leader in diverse teams and apply these to one's own work.
CO3	PO1 PO2 PO3 PO5 PO12	Maps slightly	Graduates can apply the knowledge of engineering fundamentals to design interactive pages using JavaScript also can analyze engineering problems and design solutions using modern engineering and IT tools. Students will be able to engage in independent and life-long learning.
	PO4 PO9 PO11	Maps moderately	JavaScript will be used in research.Help student to be a member or leader in diverse teams.Graduates can use JavaScript concepts in Project management.
CO4	PO1 PO3 PO5 PO12	Maps moderately	Graduates can apply the knowledge of PHP in Design/development of solutions using modern engineering and IT tools, it also helps them to engage in independent and life-long learning.
	PO2 PO4 PO9 PO10 PO11	Maps slightly	Knowledge of PHP helps analyzing engineering problems and can be used in research. This helps them to be a member or leader in diverse teams. PHP helps in client server Communication and one can apply these to one's own work, as a member and leader in a team to manage projects.
CO5	PO1 PO3 PO5 PO10 PO12	maps moderately	Students can apply the knowledge of PHP, JQuery to design server side applications that meet the specified needs using modern engineering and IT tools..
	PO2 PO9 PO11	Maps slightly	The knowledge of Javascript & PHP help students to analyze engineering problems, this also helps to be a member or leader in diverse teams and apply these to one's own work.
CO6	PO5	Maps substantially	JQuery framework will be used to model complex engineering activities with an understanding of the limitations.
	PO1 PO3 PO10 PO12	maps moderately	Graduates can apply the knowledge of PHP in Design/development of solutions and Java Script supports Client side scripting and also helps them to engage in independent and life-long learning.
	PO2	Maps slightly	Knowledge of full stack web helps analyzing engineering problems and can be used in research.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

PROJECT WORK PHASE 1 (17CSP78)

17CSP78	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Survey on various technological domains	3	3	2	1	-	-	-	-	1	-	2	-	1	-	2	-
CO2	Identify problem statement and objectives	2	2	2	1	-	-	-	-	-	-	-	-	1	-	2	-
CO3	Formulate different requirements, phases and functionalities	-	1	1	2	1	-	-	-	2	-	-	1	1	2	2	1
CO4	Design system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules	1	1	2	2	1	2	1	-	-	-	-	-	1	1	2	-
CO5	Build algorithms, code implementation, testing and validation	1	2	-	3	1	-	-	-	1	1	-	1	-	3	3	-
CO6	Prepare the project report	-	-	-	3	2	-	-	-	-	1	1	-	-	3	1	-

	PO	Level	Justification
CO1	PO1 PO2	Maps Substantial(High)	The students can able to survey on various technological domains and they can identify problem statement
	PO3 PO11	Maps Moderate (Medium)	Survey on different technological domains slightly hard for the students
	PO4 PO9	Maps Slight(Low)	Research based knowledge and research methods, analysis and interpretation of data and multidisciplinary task are difficult here
CO2	PO1 PO2 PO3	Maps Moderate (Medium)	Student required knowledge for identifying problem and creating problem statement and objectives
	PO4	Maps Slight(Low)	Student may require strong knowledge on research methods for analysis and implementation after the problem statements
CO3	PO4 PO9	Maps Moderate (Medium)	Student required knowledge for formulate different requirements, phases, functionalities and interdisciplinary actions
	PO2 PO3 PO5 PO12	Maps Slight(Low)	Student may require strong knowledge to formulate different requirements, phases, functionalities and interdisciplinary actions based on context of technological change.
CO4	PO3 PO4 PO6	Maps Moderate (Medium)	Designing and implementing of system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules will be complex process... Adopting ethical principles in multidisciplinary environments is tough task
	PO1 PO2 PO5 PO7	Maps Slight(Low)	The students required strong mathematical concepts and system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules solve complex problems. The student will have learn life-long in context of technological change
CO5	PO4	Maps Substantial(High)	The student have research-based knowledge and research methods including build algorithms, code implementation, testing and validation, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
	PO2	Maps Moderate (Medium)	The students can able build algorithms, code implementation, testing and validation
	PO1 PO5 PO9 PO10 PO12	Maps Slight(Low)	The students have to required strong mathematical knowledge for build algorithms, code implementation, testing and validation
	PO4	Maps Substantial(High)	The students can able write project report on research methods including build algorithms, code implementation, testing and validation, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

CO6	PO5	Maps Moderate (Medium)	The students can able to create project report /documents using modern tools and techniques
	PO10 PO11	Maps Slight(Low)	The students have to required write mathematical concepts in their project report and being able to comprehend and write effective reports and design documentation is low at the undergraduate level

	PSO	**Level**	**Justification**
CO1	PSO1	Maps Moderate (Medium)	The students have moderate knowledge on various technological domains through literature survey
	PSO3	Maps Slight (Low)	The graduates have limited opportunity to build their career in the software industry
CO2	PSO1	Maps Moderate (Medium)	The students have moderate knowledge on various technological domains to identify problemstatement and to set objectives
	PSO3	Maps Slight (Low)	The graduates have limited opportunity in industry just by identifying problem statement andobjectives
CO3	PSO1 PSO4	Maps Moderate (Medium)	The students have moderate knowledge on various technological domains to formulate different requirements and functionalities of different phases.
	PSO2 PSO3	Maps Slight (Low)	The graduates have limited opportunity in industry by knowing different functionalities andrequirements.
CO4	PSO1 PSO2	Maps Moderate (Medium)	The students have moderate knowledge in designing a software system through system architecture, DFD, different modules
	PSO3	Maps Slight (Low)	The graduates have limited opportunity in software industry or pursue higher studies
CO5	PSO2 PSO3	Maps Substantial (High)	The students will able to design, build algorithms, code implementation, testing and validation of project which enable greater opportunities to work in IT industries.
CO6	PSO1 PSO2	Maps Substantial (High)	The students are able to prepare the best project report by having domain knowledge and effectivecommunication for best business opportunities
	PSO3	Maps Slight (Low)	The graduates have limited opportunity to pursue higher studies

17CS32 -ANALOG & DIGITAL ELECTRONICS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Analyse the performance of FETs, Opamp circuits and their applications.	2	2	2	-	-	-	-	-	-	-	1	1	2	-	-	-
CO2	Apply simplification (SOP/POS) techniques to combinational logic circuits/expressions.	3	2	3	2	1	-	-	-	-	-	1	-	2	1	1	-
CO3	Analyze and design various data processing circuits .	3	3	2	2	-	-	-	-	-	-	1	1	2	2	1	-
CO4	Realize the working of various flip flops and their applications.	2	2	2	2	-	-	-	-	-	-	1	1	2	1	1	-
CO5	Interpret and analyze the performance of A/D and D/A converters.	2	1	1	-	-	-	-	-	-	-	-	1	1	1	1	-
CO6	Implement logic circuits using HDL models	2	-	-	1	2	-	-	-	-	-	-	1	1	2	-	-

17CS33 -DATA STRUCTURE AND APPLICATIONS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate and classify various data structures and their primitive operations	2	1										1	2			
CO2	Apply the concepts of arrays and strings in sorting and pattern matching applications	3	3	3	2	1							1	3		1	
CO3	Implement the operations of linear data structures like stacks, queues and linked lists.	3	3	2	2	2							1	3	1	1	
CO4	Demonstrate primitive operations on different types of trees and their applications	3	3	2	2	2							1	3	1	1	
CO5	Summarize the concepts of graphs, traversal techniques, hashing and file handling.	2	2	2	2	3							1	3	1	1	1
CO6	Design and develop solutions approaches to solve various computing problems by choosing appropriate data structures	3	3	3	3	3			1	1			2	2	3	3	1

17CS34 -COMPUTER ORGANIZATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Visualize the basic building blocks of computer.	3											2	3		2	
CO2	Analyze the programs as sequence of machine instructions.	3	2										2	2			
CO3	Explore different ways of communicating with I/O devices and interfaces.	3											2	2			
CO4	Design and evaluate the performance of memory systems.	3	2	3	1								1	3	2	1	
CO5	Demonstrate arithmetic and logical operations with integer and floating point operands.	3	3	3	2	1							1	3	2		
CO6	Analyze the basic functional units of processor.	3	2	3	1								1	3	2	2	

17CS35 -UNIX & SHELL PROGRAMMING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Conceptualize the features of UNIX Architecture	1											1	1		1	
CO2	Interpret basic commands for file attribute manipulation.	2											1	1		1	
CO3	Demonstrate functioning of Vi editor and its commands	2				1							2	2		1	
CO4	Illustrate the usage of various UNIX filter commands.	2				1							2	2		1	
CO5	Design programs using shell scripts	1	1	3		1							2	1		2	
CO6	Analyze process life cycle development and demonstrate Perl programs.	1	1	3		2							1	1		2	

17CS36 –DISCRETE MATHEMATICAL STRUCTURES

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify the correctness of propositional logand truth tables.	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO2	Make use of counting techniques, mathematical induction, permutations and combinations to solve problems.	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO3	Analyze and develop partial orders, relationsand functions.	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO4	Analyze the use of principle of inclusion- exclusion, derangements and recurrence relations	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO5	Analyze and develop types of graphs andtrees.	2	1	1	-	-	-	-	-	-	-	-	1	1			

17CSL37-ADE LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Utilize various electronic devices to design and construct the analog circuits	2	2	1	-	-	-	-	-	-	-	1	-	1	-	-	-
CO2	Use simulation package like multisimto design analog circuits.	-	-	1	-	3	-	-	-	1	-	1	-	1	2	-	-
CO3	Use various digital integrated circuits inthe design and demonstration of various combinational logic and data processing circuits	2	1	3	-	-	-	-	-	-	-	1	1	3	-	1	-
CO4	Design and demonstrate various types of sequential circuits using flip flops.	2	-	3	-	-	-	-	-	-	-	1	1	2	-	1	-
CO5	Use simulation package like modelsim to design various digital circuits.	-	-	1	-	3	-	-	-	1	-	1	-	1	2	-	-
CO6	Understand the working and implementation of DAC and ALU	2	1	1	-	-	-	-	-	-	-	1	1	1	-	-	-

17CSL38-DS LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Solve computational problems using basic C language constructs.	3	3	1	1	1	-	-	-	2	-	-	3	3	1	3	-
CO2	Design and implement operations on both single and Multidimensional arrays.	3	2	3	1	1	-	-	-	1	2	-	3	3	1	2	-
CO3	Develop menu driven programs to demonstrate primitive operations on stacks and queues	3	3	2	1	1	-	-	-	1	2	-	2	3	1	2	-
CO4	Assess the operations on different types of Trees.	3	3	2	-	1	-	-	-	1	2	-	2	3	1	3	-
CO5	Demonstrate traversal techniques on graphs	2	3	2	1	1	-	-	-	1	2	-	2	3	1	3	-
CO6	Apply appropriate data structures to solve computing problems	3	2	3	2	2	2	-	1	2	1	2	3	3	1	2	1

17CS42-OBJECT ORIENTED CONCEPTS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Understand object oriented programming concepts using C++	2	-	-	-	-	-	-	-	-	-	-	2	3	-	3	-
CO2	Apply fundamental concepts of OOP in JAVA	3	-	1	-		-	-	-	-	-	-	2	3	-	3	-
CO3	Implement JAVA programs using Java JDK environment	2	2	3	-	3	-	-	-	1	-	-	2	3	3	3	-
CO4	Develop multi threaded and event handling programs	1	2	3	2	2	-	-	-	1	-	-	1	3	2	3	-
CO5	Explore usage of JAVA Packages andInterfaces	1	-	1	2	3	-	-	-	1	-	-	1	3	2	3	-
CO6	Implement event driven GUI using Applets and Swings	3	2	3	2	3	-	-		1	-	-	1	3	2	2	-

17CS43 -DESIGN & ANALYSIS OF ALGORITHM

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Restate various algorithmic approaches and various problem types	3	1	-	1	-	-	-	-	-	-	-	2	3	1	-	1
CO2	Formulate the analysis frameworks for algorithms	3	3	2	-	-	-	-	-	-	-	-	1	3	3	2	-
CO3	Design, Develop and Analyze the algorithms for problems on searching and sorting	3	3	3	2	1	-	-	-	1	-	-	1	3	3	3	2
CO4	Design and Develop algorithms to solve various problems based on graphs and trees	3	3	3	2	-	-	-	-	2	-	-	1	3	3	3	2
CO5	Compare different classes of problems such as P, NP, NP Complete and NP hard	1	2	2	3	-	-	-	-	2	-	-	1	1	2	2	3
CO6	Design, Develop and Analyze the algorithms for various computational problems	3	3	3	3	-	-	-	1	1	1	1	2	3	3	3	3

17CS44-Microprocessors & Microcontrollers

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO 4
CO1	**Illustrate 8086 Architecture and Addressing modes**	1	-	-	-	-	-	-	-	-	-	-	1	3	1	-	-
CO2	Develop x86 assembly language code to solve the problems	3	1	3	-	-	-	-	-	-	-	-	1	2	1	1	-
CO3	Demonstrate interrupt routines	2	-	2	-	-	-	-	-	-	-	-	2	2	1	-	-
CO4	Interface various I/O, memory devices to x86 processor.	2	2	-	1	-	-	-		1	-	-	2	2	1	-	-
CO5	Explore ARM fundamentals and instruction set.	2	-	2	-	2	-	-	-	1	-	2	2	2	1	-	-
CO6	Develop ARM programming skills.	2	1	2	-	2		-		1	-	2	2	2	1	1	1

17CS45 - Software Engineering

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Assess professional and ethical responsibility, software engineering principles and activities involved in building large software programs.	1					3		3	1	1		2	1	1	2	3
CO2	Demonstrate the process of requirements gathering, classification, specification and validation.	1			2	1	2		1	2	2		2	1	2	2	1
CO3	Design models for software system, component and process within realistic constraints.	2	1	3	3	2	1	1	1	2	1	1	2	1	3	2	1
CO4	Apply, design, implement, verify, validate and maintain software systems with metrics.	2	2	3	3	1	1	1	1	1	1	1	2	2	2	3	1
CO5	Apply cost estimation and time scheduling for quality project activities.	3	1	2	3	2	1	2	1	2	1	3	3	2	1	2	2
CO6	Recognize the need for agile software development.	2	1	3	3	2	1	1	2	2	1	1	2		1	3	1

17CS46-DATA COMMUNICATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify various types of computer networks and connecting devices.	2	2	1	1								2	3	1	2	
CO2	Evaluate the data transmission techniques.	3	3	3	2								3	3	1	2	
CO3	Illustrate TCP/IP protocol suite and switching criteria.	2	1	2	2								2	3	2	2	
CO4	Analyze different error checking methods used in Data Link layer.	3	3	2	3	1							1	3	2	3	
CO5	Demonstrate medium access control protocols, wireless and wired LAN architecture.	3	3	2	3								1	3	2	2	
CO6	Differentiate IP versions : IPV4, IPV6 and Mobile IP.	3	3	2	3	1							2	3	2	3	

17CSL47-DAA LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	**Develop solutions for computing problems using JAVA constructs.**	3	2	2	1	1			1	2	2		3	3	1	3	
CO2	**Design, implement and asymptotically analyze various algorithms on Sorting.**	3	3	3	1	1				2	2		3	3	1	2	
CO3	**Design and implement algorithms to solve problems on Graphs.**	3	3	3	1	1				2	2		3	3	1	2	
CO4	**Design and develop algorithms to solve combinatorial problems.**	3	3	3	1	1				2	2		3	3	1	2	
CO5	**Choose appropriate algorithmic techniques to solve computational problems.**	3	2	3	2	1	1			3	1	1	3	2	1	2	
CO6	**Analyze algorithms to deduce their time complexities.**	3	3	1	1								2	2		2	

17CSL48- MICROPROCESSOR AND MICROCONTROLLER LABORATORY

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate x86 instruction set and addressingmodes	2	1	-	-	-		-	-	-	-	-	1	2		1	2
CO2	Design and implement x86 assembly languageprograms.	2	-	-	2	2	-	-	-	-	-	-	1	3	1	2	2
CO3	Explore the functioning of hardware devices andits interfacing	2	--	2	-	2	-	-	-	-	-	-	2	2	1	2	2
CO4	Demonstrate ARM instruction set and addressingmodes.	2	-	2	1	2	-	-	-	-	-	-	2	2	1	2	2
CO5	Implement ARM assembly and C languageprograms.	2	1	2		2	-	-	-	-	-	-	2	2	1	2	2
CO6	Implement interfacing of hardware devices toARM family	2	-	-	-	-	-	-	-	-	-	-	1	2	2	2	2

17CS51-MANAGEMENT ENTREPRENEURSHIP FOR IT INDUSTRY

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Comprehend Management activities	1		1	1		1	1		1		2	2	1	1	1	1
CO2	Emphasize Entrepreneur concepts and outline their importance in entrepreneurship	1	1	1	2		1	1	1	2		2	1	1	1	2	1
CO3	Apply Enterprise Resource Planning (ERP) solutions for IT industry	3	3	3	3		1	3	1	2		1	1	3	2	3	1
CO4	Propose the methods for establishing micro, small and large scale enterprises	1	2	2	2		1	1	2	1		1	1	1		1	2
CO5	Apply IPRs and institutional support for entrepreneurship	1	1	2	1		1	3	3	1	2	1	2	2		1	2
CO6	Prepare project report for IT industry based on feasibility studies	3	3	3	3		3	3	2	3	3	1	3	3		3	1

17CS52-COMPUTER NETWORKS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate the principles of application layer protocols.	3	2	1			1	1					2	3	1	2	
CO2	Distinguish transport layer services and protocols.	3	3	2	2	3	1	1					2	3	1	2	
CO3	Classify IP and Routing Algorithms in network layer.	3	3	2	3	3	1	1					2	3	2	2	
CO4	Characterize the Wireless and Mobile Networks covering IEEE 802.11 Standard.	2	1		2	3	1	1					3	2	1	3	
CO5	Demonstrate streaming and working of Distribution servers.	1			1		1	1					1	1	1	2	
CO6	Exemplify Network support for multimedia.				1		1						1			1	

17CS53-DATABASE MANAGEMENT SYSTEM

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Represent database with different data modeling concepts.	2	-	2	-	-	-	-	-	1	-	-	1	3	1	1	-
CO2	Design simple database systems.	3	2	3	2	-	-	1	-	1	-	-	2	2	1	1	-
CO3	Use Structured Query Language (SQL) forbuilding and manipulating database.	2	1	1	1	3	-	-	-	2	-	-	3	3	3	3	-
CO4	Develop application to interact with databases.	1	-	3	1	3	-	1	1	2	-	-	2	2	3	2	1
CO5	Analyze and apply normalization forbetter database design.	2	2	2	2	-	-	-	-	-	-	-	2	2	1	2	-
CO6	Demonstrate the use of concurrencycontrol and transaction processing.	1	-	1	2	2	-	1	1	1	-	-	2	2	2	2	1

17CS54-AUTOMATA THEORY & COMPUTABILITY

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation	3	3	3	2								2	3	1		-
CO2	Translate between different models of Computation	2	3	3	2								2	2	2		-
CO3	Design Grammars and Automata for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.	2	2	2	2			1					1	2	2	2	-
CO4	Apply rigorously formal mathematical methods to prove properties of languages, grammars and automata	2	2	2	2			1					1	2	2	2	
CO5	Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness.	2	1	1	3								2			2	
CO6	Classify a problem with respect to different models of Computation	2	1	1	1								2			2	

17CS553-ADVANCED JAVA AND J2EE

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Interpret enumerations and collections in advanced Java.	1				2							2	2		2	
CO2	Build programs using collection framework.	1	1	2		2							2	2	1	2	
CO3	Illustrate and develop String Handling methods in JAVA.	2	1	2		2							2	2		2	
CO4	Apply Servlets to develop web applications.	3	2	2	2	2				1		1	2	2	1	2	
CO5	Demonstrate database access using JDBC API.	3	2	2	1	2	1		1	1		1	2	2	1	2	1
CO6	Design reusable software components using JSP.	2	2	3	1	2	1			1		1	2	1	1	2	

17CS562-ARTIFICIAL INTELLIGENCE

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PS O4
CO1	Identify the AI based problems	3	1	1	1									2	2	1	
CO2	Determine the technique to solve the AI problems	2	2	2	2									2	2	2	
CO3	Investigate various learning techniques	2	2	2	2									1		1	
CO4	Analyze expert systems	2	2		1	1								1	2	2	1
CO5	Explore different stages in Natural Language processing	2	1		1									2	2	2	
CO6	Implement appropriate learning algorithms	2	2	2	1	1								2		2	

COMPUTER NETWORK LAB (17CSL57)

	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate error detection technique using CRC	2	3	1	2						2	1	2	2	1	1	
CO2	Analyze and compare different routing protocols	2	2	1	2						2	1	2	2	1	1	
CO3	Implement connection-oriented and connection-less protocols in the network	2	2	1							2	1	2	2	1	1	
CO4	Demonstrate security features in networks using RSA algorithm	2	2	1	2				1		2	1	2	2	1	1	1
CO5	Analyze techniques to avoid congestion in the network	2	2	1	2						2	1	2	1	1	1	1
CO6	Implement, analyze and evaluate networking protocols using NS3 Tool	2	1			2					1		1	1	1		

17CSL58-DBMS WITH MINI PROJECT LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate DDL commands onDatabase.	1	-	1	-	-	-	-	-	-	-	-	-	1	-	1	
CO2	Create ER diagrams and conceptualschema for the problems given.	2	1	2	1	-	-	-	-	-	-	1	-	2	2	2	
CO3	Apply Integrity constraints	2	2	2	1	-	-	-	-	-	-	1	-	2	2	2	
CO4	Demonstrate Update operations.	1	-	1	-	-	-	-	-		-	-	1	1	-	1	
CO5	Demonstrate more complex SQLqueries.	1	1	1	-	-	-	-	-	-	-	-	1	2	1	2	
CO6	Implement, analyze and evaluate the project developed for an application..	-	2	2	1	-	1	1	-	1	-	2	-	1	-	1	

17CS61-CNSCL

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO 3	PSO4
CO1	Apply the basics of number theory in various cryptographic techniques and summarize its applications	3	3		1								2	3	2	2	
CO2	Design and develop simple cryptography algorithms for real world situation.	3	3	3	2	2	2		1				2	3	2	2	1
CO3	Analyze various authentication and key agreement protocols.	1	2	1	2	1	1		1				2	2	2	2	1
CO4	Realize the security threats caused by malware, design Firewall based solutions and access control techniques to solve societal security problems.	1	3	3	2	2	2		1				2	2	2	2	1
CO5	Investigate the need of security at different levels/layers and its services.	1	2	2	1	1	1		1				2	1	2	2	1
CO6	Understand cyber security and illustrate the need of cyber Law.	1	2		1		3		2				3		1	2	2

17CS62-COMPUTER GRAPHICS & VISUALIZATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Design and implement algorithms for 2D graphics primitives and attributes.	2	1	2	1	2							1	2	2	2	
CO2	Illustrate geometric transformations on both 2D and 3D objects.	2	2	2	1	3				1			2	2	2	2	
CO3	Apply concepts of clipping and visible surface detection in 2D and 3D viewing, and illumination models.	2	3	3	2	3							2	2	2	2	
CO4	Decide suitable hardware and software for developing graphics applications using OpenGL.		1	1	1	3			1	1			1		2	3	
CO5	Explore different representation of Programming event driven input.			2	1	2				1			2	1		3	
CO6	Demonstrate and analyze the concepts of curve surfaces.	2	3	2	3	2				1			2	2		2	

17CS63 - System Software and Compiler Design

	Course Outcome	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Interpret the concepts of assemblers and macro processors	2	-	-	-	-	-	-	-	-	-	-	1	1	-	1	-
CO2	Illustrate the functions, features and design options of loader	1	-	-	-	2	-	-	-	-	-	-	1	1	-	1	-
CO3	Classify the phases of compiler and build lexical analyzers	3	2	2	1	2	-	-	-	-	-	-	1	2	1	1	-
CO4	Design parsers for compilers	3	1	1	1	2	-	-	-	-	-	-	2	2	2	1	-
CO5	Construct Syntax Directed Translation and generate intermediate code	2	1	-	1	2	-	-	-	-	-	-	1	2	-	1	-
CO6	Generate ASM code for a given intermediate code	3	1	1	1	-	-	-	-	-	-	-	2	1	-	2	-

17CS64-OPERATING SYSTEMS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify the functionalities of OS and theircategories	3	-	1	-	-	-	-	-	-	-	-	2	3	-	1	-
CO2	Evaluate multithread techniques and process scheduling algorithms	2	3	3	2	-	1	1	-	-	-	-	3	2	3	2	-
CO3	Demonstrate suitable techniques for resource management	3	3	3	2	-	1	1	-	-	-	-	2	3	3	1	-
CO4	Evaluate file system allocation andmemory management techniques	3	3	3	2	-	1	1	-	-	-	-	2	3	2	2	-
CO5	Review the protection mechanisms inprocessing environment	-	-	-	-	-	1	-	1	-	-	-	1	1	2	1	1
CO6	Explore the case studies on Operating Systems	-	1	-	-	-	-	-	-	-	2	-	1	-	-	1	1

17CS651-DATA MINING AND DATAWAREHOUSING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify data mining problems and implement thedata warehouse	-	-	-	-	-	-	-	-	-	-	-	2	2	2	-	-
CO2	Define multi-dimensional data models	2	2	-	-	3	-	-	-	-	-	-	2	-	2	2	-
CO3	Categorize types of data and preprocessingtechniques.	1	1	-	1	-	-	-	-	-	-	-	2	1	-	-	-
CO4	Evaluate Association algorithms and itsapplications.	1	2	1	2	1	2	-	-	-	-	-	2	1	2	2	-
CO5	Apply various Classification techniques and different types of classifiers	-	2	1	-	3	2	-	-	2	1	-	2	-	2	2	-
CO6	Analyze and adapt existing clustering techniquesin various applications.	-	2	1	2	3	2	-	-	2	1	-	2	-	-	-	-

17CS653-OPERATION RESEARCH

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Understand how to translate a real-world problem, into a mathematical formulation	3	3	1										3	2		
CO2	Identify and apply optimization techniques forvarious problems	2	2	2	2									2	2	2	
CO3	Model the given problem as transportationproblem and solve.	2	2	2										2	2		
CO4	Apply game theory for decision support system	2	2	2	1									2	2	2	
CO5	Analyze and apply branch-and-bound andheuristic methods to solve general integerproblems	2	2	2	2									2	2	2	
CO6	Incorporate the principles of assignment of jobsand find the optimal solution	2	2	2										2	2		

17CS664-PYTHON APPLICATION PROGRAMMING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Examine python syntax and semantics and be fluent in using flow control andfunctions	1	2			3							1	2	2	3	
CO2	Demonstrate proficiency in handlingstrings and file systems in python	1	2	2	2	3							1	1	3	2	
CO3	Create and run python programs using core data structures like lists, dictionaries , tuples, and sets and use ofRes	2	2	3	2	3							2	1	3	2	
CO4	Interpret and apply the concepts of OOP	2	1	3	-	3						3	2	1	3	2	
CO5	Implement exemplary applications related to network programming andweb services	2	2	3	2	3						3	2	1	3	2	
CO6	Implement database applications inpython	2	2	3	2	3						3	2	1	3	2	

17CSL67-SS & OS LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Implement and demonstrate Lexer's and Parser's.	3	1	3	2	3	-	-	-	-	-	-	1	-	-	1	-
CO2	Design and implement variousparsing techniques.	3	3	3	2	3	-	-	-	-	-	1	1	2	1	2	-
CO3	Design and implement a codegenerator	3	3	3	2	1	-	-	-	-	-	1	1	3	1	3	-
CO4	Evaluate different process scheduling algorithms in operatingSystem.	3	2	3	2	1	-	-	-	-	-	-	1	2	1	1	-
CO5	Design and implement a solution for deadlocks in operating system	3	2	3	2	1	-	-	-	-	-	-	1	1	1	1	-
CO6	Evaluate different algorithms required for management of pageallocation techniques	3	2	3	2	1	-	-	-	-	-	-	1	1	1	2	-

17CSL68-CG&V Lab WITH MINI PROJECT

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Apply the concepts of computergraphics.	2	1	2	-	2	-	-	-	-	-	-	2	2	1	1	-
CO2	Implement computer graphics applications using OpenGL.	2	2	3	2	2	-	-	-	-	-	-	2	2	2	1	-
CO3	Animate real world scenarios usingOpenGL	2	2	3	2	2	1	1	-	3	3	2	2	2	2	2	-
CO4	Rasterize 2D primitives usingOpenGL	2	3	2	1	2	-	-	-	-	-	-	2	2	2	1	-
CO5	Implement different clippingalgorithms.	2	2	2	1	2	-	-	-	-	-	-	2	3	2	1	-
CO6	Transform 2D and 3D geometricobjects.	3	3	2	1	2	-	-	-	2	-	-	2	2	2	1	

17CS71- Web Technology and its Applications

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Adapt HTML and CSS syntax and semantics to build web pages.	2	-	2	-	2	-	-	-	1	-	1	2	2	2	3	-
CO2	Construct and visually format tables and forms using HTML and CSS	2	-	2	-	2	-	-	-	1	-	1	2	2	2	2	-
CO3	Develop Client-Side Scripts using JavaScript	2	2	3	1	3	-	-	-	2	1	2	3	3	3	3	-
CO4	Develop Server-Side Scripts using PHP	2	1	2	1	3		-	-	2	1	2	3	3	3	3	-
CO5	Appraise the principles of object oriented development using PHP	2	1	3	1	3	-	-	-	2	2	2	3	3	2	3	2
CO6	Inspect JavaScript frameworks jQuery and Backbone	2	1	3	1	3	-	-	-	3	2	2	3	3	3	3	-

17CS72-ADVANCED COMPUTER ARCHITECTURE

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Understand the concepts of parallel computing	2	-	-	-	-	-	-	-	-	-	-	1	2	-	1	-
CO2	Demonstrate the concepts of hardware technologies	2	-	-	-	-	-	-	-	-	-	-	1	2	-	1	-
CO3	Explore bus, cache, shared memory with pipelining and super scalar techniques	2	1	-	-	-	-	-	-	-	-	-	1	2	-	1	-
CO4	Classify parallel architecture	2	1	1	-	-	-	-	-	-	-	-	1	2	-	1	-
CO5	Assess Scalable architecture	2	1	1	-	-	-	-	-	-	-	-	1	2	-	1	-
CO6	Investigate parallel programming concept	2	1	1	-	-	-	-	-	-	-	-	1	2	-	1	-

17CS73-Machine Learning

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Understand machine learning and problems relevant to machine learning	2	1	1									1	2		2	2
CO2	Analyze concept learning and decision trees.	2	2	1	1	1				1			2	2	1	2	2
CO3	Apply artificial neural networks in machine learning.	2	2	1	2	1				1			2	2	1	2	2
CO4	Interpret and realize Bayesian methods	2	2	1	2	1				1			2	2	1	2	2
CO5	Investigate instance based learning	2	2	1	2	1				1			2	2	1	2	2
CO6	Evaluate hypothesis and examine reinforcement learning. .	2	2	1	2	1				1			2	2	1	2	2

17CS742- CLOUD COMPUTING AND ITS APPLICATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Understand the concept of cloud computing, virtualization and classifyservices of cloud computing	3	3	2			3							3	3		
CO2	Illustrate architecture and programming incloud		3		2												
CO3	Define the platforms for development of cloud applications and list the applicationof cloud	2		2								2			1		
CO4	Develop Server-Side Scripts using PHP Analyze various cloud programming models and apply them to solve problems on the cloud	2	2	3									2	2			
CO5	Understand the core issues of cloud computing such as security, privacy, andinteroperability						3	1									
CO6	Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS,public cloud, private cloud, hybrid cloud, etc.		2	2								2			2	1	1

17CS744-UNIX SYSTEM PROGRAMMING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Distinguish among ANSI C & POSIXstandards	2		1	1								2	1		2	-
CO2	Illustrate UNIX Kernel support for files	1		1	2	1							2	1		2	
CO3	Understand Kernel support for process	1		2	1								2	2		2	
CO4	Interpret Process Accounting, processUID ,Terminal logins, network logins	1		2	1								2	2		2	
CO5	Analyze process control, Deamon characteristics, coding rules and error logging	1		1	1	1							1	2		1	
CO6	To build an application/service over aUNIX system	1		1	1	1				1		1	3	2	3	2	1

17CS754 -SAN

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Examine the Storage Area Networks characteristics, components and storage architectures	1											1	1		1	1
CO2	Exemplify the concept of RAID and their suitability for different application environments	1	2	1	1								1	1		1	1
CO3	Analyze file sharing operations on NAS and IP-SAN of the different networks	1	1										1	1		1	1
CO4	Depict the working of Storage Virtualization on Various levels of Storage	1											1	1		1	1
CO5	Illustrate the concepts of business continuity and disaster recovery in a storage infrastructure	1											1	1		1	1
CO6	Demonstrate the Knowledge of Securing the local replication in Storage Infrastructure and Cloud	1											1	1		1	1

17CSL76-Machine Learning Laboratory

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Implement and demonstrate the concept learning algorithms (FIND-S, Candidate-Elimination)	2	2	2									2	2	1	2	
CO2	Demonstrate the working of the decision tree and apply this knowledge to classify a new sample. (ID3)	2	2	2		1							2	2	1	2	
CO3	Build an Artificial Neural Network by implementing the Back propagation algorithm.	2	2	2		1							2	2	1	2	
CO4	Apply the naïve Bayesian classification methods and build Bayesian network.	2	2	2	2	1							2	2	1	2	
CO5	Implement EM algorithm, k-means and Compare their results.	2	2	2	2	1							2	2	1	2	
CO6	Investigate instance based and regression algorithms.	2	2	2		1							2	2	1	2	

17CSL77 -WEB TECHNOLOGY Laboratory with Mini Project

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Develop web pages using HTML5 and CSS.	2											1	2		1	2
CO2	Design dynamic web pages using JavaScript	2	1	2		1				1		1	2	2		1	2
CO3	Create interactive web applications using PHP.	2	2	2	1	2				1		1	2	2		2	1
CO4	Explore different Web Services, Internet Tools and Database	2	1	2	1	2				1	1	1	2	2	1	2	2
CO5	Design and Develop Web project	2	1	2		2				1	2	1	2	2	1	2	2
CO6	Evaluate and Document Web project	2	1	2		3					2		2	1	1	2	2

PROJECT WORK PHASE 1 (17CSP78)

17CSP78	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Survey on various technological domains	3	3	2	1	-	-	-	-	1	-	2	-	1	-	2	-
CO2	Identify problem statement and objectives	2	2	2	1	-	-	-	-	-	-	-	-	1	-	2	-
CO3	Formulate different requirements, phases and functionalities	-	1	1	2	1	-	-	-	2	-	-	1	1	2	2	1
CO4	Design system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules	1	1	2	2	1	2	1	-	-	-	-	-	1	1	2	-
CO5	Build algorithms, code implementation, testing and validation	1	2	-	3	1	-	-	-	1	1	-	1	-	3	3	-
CO6	Prepare the project report	-	-	-	3	2	-	-	-	-	1	1	-	-	3	1	-

18MAT31

	Program Outcomes											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	3	1	2	2	2	1	1	2	2	3
CO2	3	3	3	2	2	2	2	1	1	2	2	3
CO3	3	3	3	1	1	1	1	1	1	1	1	3
CO4	3	3	3	2	2	2	2	1	2	2	2	3
CO5	3	3	3	2	2	2	2	1	2	2	2	3

COs	**POs**	**CRL**	**Justification**
	PO12	3	It is mathematical field which needs lot of research
	P09	1	Team work needed to provide students hands on experience utilizing fourier techniques
CO2	PO1, PO2 PO3	3	Fourier transform and Z Transforms are the basic tools for solving complex engineering problems
	PO5, PO6 PO7	2	FT and ZT can afford mathematical devices through which solutions of numerous boundary value problems of

	PO4	2	Knowledge in can be used to develop an efficient system
	PO8	1	FT and ZT will commit to ethical principles and responsibilities
	PO10, PO11	2	Write up for complex engineering problems will be given
	PO12	3	It is mathematical field which needs lot of research
	PO9	1	Team work needed to provide students hands on experience utilizing fourier techniques
CO3	PO1, PO2 PO3, PO4	3	Numerical method use to solve algebraic and transcendental equation also simultaneous and non liner equati iterative method for the solution of eigen value problem.
	PO4	1	An ability to conduct investigations of complex problems by methods that include appropriate experiments, interpretation of data, and synthesis of information in order to reach validconclusions
	PO5, PO6 PO7, PO9 PO10, PO11	1	Numerical techniques have become indispensible tool in the hand s of engineers. There are lots of methods ca more accurate
	PO8	1	Mathematical modelling will commit to ethical principles and responsibilities
	PO12	3	It is a mathematical field which needs lot of research
CO4	PO1, PO2 PO3, PO4	3	Apply greens ,divergence and stokes theorem in various application in engineering field particularly elector gravitational fields and fluid flow problems
	PO5, PO6 PO7	2	Tool to convert line to surface integrals, surface to volume integrals.
	PO8	1	Mathematical modelling will commit to ethical principles and responsibilities
	PO9 PO10, PO11	2	Write up for complex engineering probl
	PO12	3	It is mathematical field which needs lot of research
	PO1 PO2 PO3	3	To solve the problems in dynamics of rigid bodies, optimization of orbits and vibration problems. And also fi minimum value of the definite integral involving certain functions.

CO5	PO4, PO5 PO6, PO7	2	Finding maximum and minimum value of the definite integral involving certain functions.
	PO9, PO10 PO11	2	Understand the concepts of mathematics and apply it to their work as a member or leader in a team to man
	PO8	1	Mathematical modelling will commit to ethical principles and responsibilities
	PO12	3	The students will become aware of the need for life long learning and the continued upgrading of technical k of numerical calculus
CO6	PO1, PO2, PO3	3	Z Transforms are the basic tools for solving complex engineering problems
	PO4, PO5 PO6, PO7	2	ZT can afford mathematical devices through which solutions of numerous boundary value problems of engin
	PO9, PO10 PO11	2	Write up for complex engineering problems will be given
	PO12	3	It is mathematical field which needs lot of research

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS32 -DATA STRUCTURE AND APPLICATIONS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate and classify various data structures and their primitive operations	2	1										1	2			
CO2	Apply the concepts of arrays and strings in sorting and pattern matching applications	3	3	3	2	1							1	3		1	
CO3	Implement the operations of linear data structures like stacks, queues and linked lists.	3	3	2	2	2							1	3	1	1	
CO4	Demonstrate primitive operations on different types of trees and their applications	3	3	2	2	2							1	3	1	1	
CO5	Summarize the concepts of graphs, traversal techniques, hashing and file handling.	2	2	2	2	3							1	3	1	1	1
CO6	Design and develop solutions approaches to solve various computing problemsb y choosing appropriate data structures	3	3	3	3	3			1	1			2	2	3	3	1

CO1	PO	Level	Justification
	PO1	Moderately	The knowledge of mathematical principles and basics of computer science will help the students to classify various data structures and their primitive operations.
	PO2	Slightly	
	PO12	Slightly	The knowledge of research and natural science does not contribute the stated CO; Data Structures is part of any programming based applications.

CO2	PO1 PO2 PO3 PO4 PO5 PO12	Substantially Substantially Substantially Moderately Slightly Slightly	Knowledge of fundamental maths is essential for pattern matching ans sorting techniques. Sorting techniques needs analysis schemes which in turn needs maths background Pattern matching and sorting is an integral part of any complex engineering problem The concepts of sorting and pattern matching moderately makes use of research methods. Primitive editing and debugging tools are used. Pattern matching and sorting is an integral part of any engineering problem
CO3	PO1 PO2 PO3 PO4 PO5 PO12	Substantially Substantially Moderately Moderately Moderately Slightly	Understanding of stacks, queues , linked lists is key to solution of many engineering problems Concepts of stacks, queues and linked lists are important Design solutions for complex programming applications contain basics of Stacks, queues and linked lists. Analysis, interpretation of data and design of experiments requires extensive knowledge of linked lists. Primitive editing and debugging tools are used. Any computer based applications require the concepts of stacks, queues and linked list
CO4	PO1 PO2 PO3 PO4 PO5 PO12	Substantially Substantially Moderately Moderately Moderately Slightly	The knowledge of mathematical principles helps in understanding the basic structure of trees. Primitive operations of trees such as insertion, deletion, traversals are very essential in solving engineering problems. Tree operations are integral part of any complex engineering problem Research oriented projects require the data to be represented in tree format Practising project's solution makes use of modelling based on trees. Concept of trees is found to be used in diverse areas of engineering and technology.
CO5	PO1 PO2 PO3 PO4 PO5 PO12	Moderately Moderately Moderately Moderately Slightly Slightly	Mathematical knowledge helps in performing traversals on graphs and random access on files . Basic Hashing operations are used in solving several engineering problems. Applications concerned with cultural, societal and environmental considerations makes use of file and hashing operations. Effective searching techniques can be implemented using hashing and effective storage using files. Practising project's solution makes use of modelling based on graphs and hashing concepts Graph based applications are relevant to broader category of applications

CO6	PO1 PO2 PO3 PO4 PO5 PO8 PO9 PO12	Substantially Substantially Substantially Substantially Substantially Slightly Slightly Moderately	Knowledge of mathematics and engineering fundamentals are extensively used in designing appropriate data structures to solve engineering problems. Designing solution approach using proper data structures makes extensive use of maths and research literature. Choosing appropriate data structure is essential while designing health based and safety projects Data structures is primary component in solving research based problems. Usage of modern IT tools helps in understanding the working of complex data structures. Ethics in programming must be inculcated in engineering practice. Team work plays vital role while carrying out projects using heterogeneous data structures Most of computer science based projects would need the extensive usage of various data structure

	PSO	**Level**	**Justification**
CO1	PSO1	Moderately	Various data structures and their primitive operations are crucial in Computer Science based projects
CO2	PSO1 PSO3	Substantially Slightly	Sorting and pattern classification makes extensive usage of Maths The concepts of sorting and pattern matching are integral part of most of computer based projects and courses.
CO3	PSO1 PSO2 PSO3	Substantially Slightly Slightly	Understanding of stacks, queues , linked lists is key to solution of many engineering problems Concepts of stacks, queues and linked lists are vital in post graduate courses/projects
CO4	PSO1 PSO2 PSO3	Substantially Slightly Slightly	The knowledge of mathematical principles helps in understanding the basic structure of trees. Primitive operations of trees such as insertion, deletion, traversals are very essential in solving engineering problems. Tree operations are integral part of career of a computer science graduate .
CO5	PSO1 PSO2 PSO3 PSO4	Substantially Slightly Slightly Slightly	Mathematical knowledge helps in performing traversals on graphs and random access on files . Graph traversals and hashing needs the knowledge of different subjects like maths, graph theory and algorithmic techniques. Graph based applications are relevant to broader category of applications
CO6	PSO1 PSO2 PSO3 PSO4	Moderately Substantially Substantially Slightly	Knowledge of mathematics and engineering fundamentals are extensively used in designing appropriate data structures to solve engineering problems. Choosing appropriate data structure and designing IT systems needs the exposure to modern tool usage. Data structures is the core stream of computer science and is widely used in most of the computer science based projects Ethics and integrity in designing/programming must be

			inculcated in engineering practice.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS33 -ANALOG & DIGITAL ELECTRONICS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Analyse the performance of FETs, Opamp circuits and their applications.	2	2	2	-	-	-	-	-	-	-	1	1	2	-	-	-
CO2	Apply simplification (SOP/POS) techniques to combinational logic circuits/expressions.	3	2	3	2	1	-	-	-	-	-	1	-	2	1	1	-
CO3	Analyze and design various data processing circuits .	3	3	2	2	-	-	-	-	-	-	1	1	2	2	1	-
CO4	Realize the working of various flip flops and their applications.	2	2	2	2	-	-	-	-	-	-	1	1	2	1	1	-
CO5	Interpret and analyze the performance of A/D and D/A converters.	2	1	1	-	-	-	-	-	-	-	-	1	1	1	1	-
CO6	Implement logic circuits using HDL models	2	-	-	1	2	-	-	-	-	-	-	1	1	2	-	-

	PO	Level	Justification
CO1	PO1 PO2, PO3	Moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to moderately understand the working of FETs and Opamp circuit to analyse their performance. Also provide design solution for the given specification for certain applications.
	PO11, PO12	Slightly	Students can manage to do projects using opamps in multidisciplinary environment to a slighter extent and provides scope for career development leading to lifelong learning.

CO2	PO1 PO3	Substantially	The knowledge of mathematical principles and basics of science will help the students to apply the same to substantially understand the simplification techniques pertaining to combinational logic and will be able to design logic circuits for the given SOP POS function.
	PO2,PO4	Moderately	Student will be able to apply first principles of mathematics and science to moderately analyse and verify the combinational logic problems.
	PO5 PO11	Slightly	Students can use modern tools to simulate combinational logic circuits and manage to do projects using combinational logic in multidisciplinary environment to a slighter extent.
CO3	PO1 PO2	Substantially	The knowledge of mathematical principles and basics of science will help the students to apply the same to substantially analyze certain data processing circuits
	PO3 PO4	Moderately	Student will be able to apply first principles of mathematics and science to design few data processing circuits to a moderate extent and also can verify certain design problems pertaining to few data processing circuits.
	PO11 PO12	Slightly	Students can manage to do projects using data processing circuits in multidisciplinary environment to a slighter extent and get scope for career development leading to lifelong learning.
CO4	PO1 PO2 PO3 PO4	Moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to moderately understand and verify the working of various flip flops, analyze their functionality in certain applications like registers and counters and will be able to design sequential circuits for the given specification to a moderate extent.
	PO11,PO12	Slightly	Students can manage to do projects using sequential logic circuits in multidisciplinary environment to a slighter extent and get scope for career development leading to lifelong learning.
CO5	PO1	Moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to moderately analyze the performance of certain A/D and D/A converters.
	PO2, PO,3 PO12	Slightly	Student will be able to apply first principles of mathematics and science to analyze the working of certain A/D and D/A converters and also design few A/D converters to do projects in multidisciplinary environment to a slighter extent.
CO6	PO1 PO5	Moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to moderately understand the various HDL models and implement certain logic circuits using VHDL/Verilog HDL aided by modern simulation tools like xilinx.
	PO4 PO12	Slightly	Student will be able to verify certain HDL models for few problems pertaining to digital circuits and get scope for career development leading to lifelong learning.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS34 -COMPUTER ORGANIZATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Visualize the basic building blocks of computer.	3											2	3		2	
CO2	Analyze the programs as sequence of machine instructions.	3	2										2	2			
CO3	Explore different ways of communicating with I/O devices and interfaces.	3											2	2			
CO4	Design and evaluate the performance of memory systems.	3	2	3	1								1	3	2	1	
CO5	Demonstrate arithmetic and logical operations with integer and floating point operands.	3	3	3	2	1							1	3	2		
CO6	Analyze the basic functional units of processor.	3	2	3	1								1	3	2	2	

	PO	Level	Justification
CO1	PO1	Substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and analyse its performance .
	PO12	Moderately	Performance analysis helps the students to gain the research based knowledge and life-long learning.
CO2	PO1	Substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and to generate the basic assembly language code.

	PO2 PO12	Moderately	Students are able to encode the machine instructions and its memory requirement and to apply the same in life long learning.
CO3	PO1	Substantially	The knowledge of basics of computer science will help the students to understand the communication between processor and I/O devices.
	PO12	Moderately	Students are able to analyze the bus structure and its applications.
CO4	PO1 PO3	Substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and to exploit cache performance and also enables students to design memory of different organizations.
	PO2	Moderately	Performance of processor is analyzed theoretically using various cache coherence protocols and replacement algorithms.
	PO4,PO12	Slightly	Students will learn how to improve the cache miss and cache miss penalty and to apply the same in life long learning.
CO5	PO1, PO2 PO3	Substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and to increase the performance of processor using carry save adder, fast multiplication.
	PO4	Moderately	Students are able to analyze the problems on Booth's algorithm by increasing the number of bits.
	PO5,PO12	Slightly	Students are able to solve the problems using simulators.
CO6	PO1,PO3	Substantially	The knowledge of basics of computer science will help the students to understand the working of processor and the generation of control signals..
	PO2	Moderately	Students are able to analyse the microroutine.
	PO4,PO12	Slightly	Students gain knowledge on microcontrollers.

CO	**PSO**	**LEVEL**	**Justification**
CO1	PSO1	Substantially	Students will get solid foundation in the principles and practices of computer science, including mathematics, science and basic engineering.
	PS03	Moderately	After gaining the knowledge in fundamentals, students will be prepared for their careers in the software industry or pursue higher studies and continue to develop their professional knowledge.
CO2	PSO1	Moderately	Students are able to write assembly language programs
CO3	PSO1	Moderately	Students are able to understand how I/O devices communicate within the system.

CO4	PSO1	Substantially	Students are able to analyze the memory system.
	PSO2	Moderately	Students are able to analyze flip flops, inverters and also virtual memory organization
	PSO3	Slightly	After learning memory systems, students can continue to excel their career in hardware .
CO5	PSO1	Substantially	The graduates will have solid foundation in the principles and practices of computer science, including mathematics, science and basic engineering.
	PSO2	Moderately	Will get skills to work on arithmetic operations.
CO6	PSO1	Substantially	The knowledge of basics of computer science will help the students to understand the working of processor and the generation of control signals..
	PSO2	Moderately	Students are able to analyse the microroutine using microprogrammed control unit..
	PSO3	Moderately	Analyze the working of microcontrollers.

18CS35 - Software Engineering

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Assess professional and ethical responsibility, software engineering principles and activities involved in building large software programs.	1					3		3	1	1		2	1	1	2	3
CO2	Demonstrate the process of requirements gathering, classification, specification and validation.	1			2	1	2		1	2	2		2	1	2	2	1
CO3	Outline the concepts of object-oriented and modeling	1											3	2		2	1
CO4	Design models for software system, component and process within realistic constraints.	2	1	3	3	2	1	1	1	2	1	1	2	1	3	2	1
CO5	Apply, design, implement, verify, validate and maintain software systems with metrics	2	2	3	3	1	1	1	1	1	1	1	2	2	2	3	1
CO6	Apply cost estimation and time scheduling for quality project activities.	3	1	2	3	2	1	2	1	2	1	3	3	2	1	2	2

	PO	Level	Justification

CO1	PO1, PO9,	Slightly	The knowledge of Software engineering fundamentals, will help the students to solve of complex engineering problems, function effectively as an individual, and as a member or leader in diverse teams and communicate effectively on complex engineering activities with the engineering community and with society at large.
	PO12	Moderately	Understand the recent developments and life-long learning.
	PO6,	Strongly	Commit to professional ethics and responsibilities
CO2	PO1, PO5, PO8	Slightly	The knowledge of basics of computer science, modern engineering and IT tools, ethical principles will help the students to apply the same and gather requirements
	PO4, P06, P09, PO10, P012	Moderately	Analyze complex engineering problems, apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues in requirements gathering, classification, specification and validation, ability to engage in independent and life-long leaning in the broadest context of technological change and ethically function effectively as an individual, and as a member or leader in diverse teams.
CO3	PO1,	slightly	The knowledge of basics of computer science will help slightly to the students to apply the same and identify various concepts of object-oriented modeling.
	PO12	Strongly	Communicates effectively to students through designing documentation
CO4	PO2, PO6, PO7, P08, PO10,PO11	Slightly	Ethically analyze, apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, communicate effectively on complex engineering activities in Design models for sustainable development of software system and Understand project management.
	PO1, PO5 PO9 POl2	Moderately	Modem design tool usage for software system, component, mem within realistic constraints has been analyzed. Function effectively as an individual, and as a member or leader in diverse teams for system design Understand the recent developments and life-long learning.
	PO1,P O2	Strongly	The knowledge of Software analysis and design helps in development of software solutions
CO5	PO2, PO6 PO8, PO10	Slightly	Ethically analyze cost estimation and time scheduling for quality project activities. By applying engineering knowledge and Communicate effectively on complex engineering project activities
	PO3, PO5 PO7, PO9	Moderately	Using modern tools in project scheduling, design solutions for complex engineering problems and function effectively as an individual: and as a member or leader in diverse teams in sustainable project development.

	PO1, PO4 PO11, PO12	Strongly	The knowledge of basics of computer science, analyze, demonstrate knowledge and understanding of the engineering and management principles. Understand project management and finance.
CO6	PO5,PO6, PO7,PO8 PO9, PO10 PO11	Slightly	Function effectively as an individual and as a member or leader in diverse teams, modem engineering and IT tools used for ethically Analyze, design: implement: verify, validate: maintain software systems with metrics with knowledge to assess societal: health: safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
	PO1, PO2, PO12	Moderately	The knowledge of basics of computer science will help the students to analyze, design, implement, verify, validate, maintain software systems. Understand the recent developments and life-long learning.
	PO3	Strongly	Analyze and design solutions for complex engineering problems

CO1	**PSO**	**Level**	**Justification**
	PSO1, PSO2	Slightly	The knowledge of basics of computer science will help the students to assess professional and ethical responsibility, software engineering principles and activities involved in building large software programs.
	PS03	Moderately	The knowledge of software engineering principles and activities involved in building large software programs helps in student careers in the software industry or pursue higher studies and continue to develop their professional knowledge.
	PSO4	Strongly	The knowledge of professional and ethical responsibility used to practice the profession with ethics, integrity, leadership and social responsibility.
CO2	PSO1 PSO4	Slightly	The process of requirements gathering, classification, specification and validation knowledge helps in building solid foundation in the principles and practices of computer science, leadership and social responsibility.
	PSO2 PSO3	Moderately	Requirements gathering skills used to communicate effectively using modem tools and prepare students for careers in the software industry
CO4	PSO1 PSO4	Slightly	The knowledge of computer science used to understand design models for software system, component, process demonstrate leadership and social responsibility.
	PSO3	Moderately	Design knowledge prepare students for their careers in the software industry or to pursue highs studies and continue to develop their professional knowledge
	PSO2	Strongly	Software design skills helps student to function as member of multi-disciplinary teams
CO5	PSO1, PSO3,P S4	Moderately	The knowledge of basics of computer science will help the students to apply the same and exploit quality project activities, leadership and social responsibility. Prepare students for their careers in the software industry or pursue higher studies and continue to develop their professional knowledge.

	PSO2	Slightly	Cost estimation and time scheduling for quality project activities Skills used to function as members of multi-disciplinary teams and to communicate effectively using modern tools.
CO6	PSO1 PS02	Slightly	The knowledge of basics of computer science will help the students to Analyze, design, implement, verify, validate, maintain software systems. Understand to communicate effectively using modem tools.
	POS4	Moderately	Students learn to practice the profession with ethics, integrity, leadership and social responsibility.
	PSO3	Strongly	Students prepared for their careers in the software industry or pursue highs studies and continue to develop their professional knowledge.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS36 –DISCRETE MATHEMATICAL STRUCTURES

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify the correctness of propositional log and truth tables.	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO2	Make use of counting techniques, mathematical induction, permutations and combinations to solve problems.	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO3	Analyze and develop partial orders, relations and functions.	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO4	Analyze the use of principle of inclusion-exclusion, derangements and recurrence relations	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO5	Analyze and develop types of graphs and trees.	2	1	1	-	-	-	-	-	-	-	-	1	1			

COs	POs	CRL	Justification
CO1	PO1	2	Along with the knowledge of mathematics, the concept of discrete mathematical structures is used for different applications of engineering.
	PO2	1	Discrete mathematical structures are used to identify, formulate and design a mathematical model for many engineering problems.
	PO3	1	The acquired mathematical knowledge is used for design of engineering problems.

	PO12	1	Knowledge of discrete structures is used for application of any chosen area in engineering disciplines for generating a mathematical model.
CO2	PO1	2	Study of logical connectives in discrete structure help in providing the solutions to engineering problems.
	PO2	1	By using with concept of logical connectives different problems are analyzed.
	PO3	1	The correctness of the analysis of the problem is better understood by the logical connectives.
	PO12	1	Knowledge of mathematics is used for application of any chosen area in engineering disciplines for generating a mathematical model.
CO3	PO1	2	The concept of relations and functions are applied to find solutions for some engineering problems.
	PO2	1	The theory of partial order is used to analyze the solutions pertaining to the problems.
	PO3	1	knowledge of Hasse diagram is used to design engineering problems.
	PO12	1	Knowledge of mathematical structures is used for application of any chosen area in engineering disciplines for generating a mathematical model.
CO4	PO1	2	Knowledge of discrete structures like rook polynomials is used in solving domain specific problems.
	PO2	1	Knowledge of discrete structures like recurrence relations is used analyze engineering problems.
	PO3	1	knowledge of derangements is used to design engineering problems.
CO5	PO12	1	Knowledge of the principle of inclusion-exclusion is used for application of chosen area in engineering disciplines for generating a mathematical model.
	PO1	2	The knowledge of group theory is used in various engineering problems.
	PO2	1	The theory of Error detection and error correction codes is used in analysis of engineering problems.
	PO3	1	The concept of group theory to design the solutions for engineering problems.
	PO12	1	Knowledge of trees is used for application of any chosen area in engineering disciplines for generating a mathematical model.

COs	**POs**	**CRLs**	**Justification**
CO1	PSO1	1	The concept of Fundamentals of logic is applied for solving engineering problems.
CO2	PSO1	1	Analysis of problems using combinatorics is done by adapting software development methodology.
CO3	PSO1	1	Concept of relations and functions followed to solve an engineering problem.

CO4	PSO1	1	Specific counting techniques and recurrence relations are used to solve complex engineering problems.
CO5	PSO1	1	The method of Discrete structures such as Graph theory and combinatorics used to understand domain specific initiatives.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CSL37-ADE LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Utilize various electronic devices to design and construct the analog circuits	2	2	1	-	-	-	-	-	-	-	1	-	1	-	-	-
CO2	Use simulation package like multisim to design analog circuits.	-	-	1	-	3	-	-	-	1	-	1	-	1	2	-	-
CO3	Use various digital integrated circuits in the design and demonstration of various combinational logic and data processing circuits	2	1	3	-	-	-	-	-	-	-	1	1	3	-	1	-
CO4	Design and demonstrate various types of sequential circuits using flip flops.	2	-	3	-	-	-	-	-	-	-	1	1	2	-	1	-
CO5	Use simulation package like modelsim to design various digital circuits.	-	-	1	-	3	-	-	-	1	-	1	-	1	2	-	-
CO6	Understand the working and implementation of DAC and ALU	2	1	1	-	-	-	-	-	-	-	1	1	1	-	-	-

CO1	PO	Level	Justification
	PO1 PO2	Moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to implement few analog circuits and analyze their functionality at a moderate level.
	PO3 PO11	Slightly	Student will be able to design few analog circuits and do projects in multidisciplinary environment to a slighter extent.

CO2	PO5	Substantially	Students will be able to use modern simulation tool like multisim to substantially analyze the working of analog circuits by simulation.
	PO3 PO9 PO11	Slightly	Student will be able to use simulation tools to design few analog circuits and do projects individually or in multidisciplinary environment to a slighter extent.
CO3	PO3	Substantially	Student will be able to substantially design and implement various combinational logic circuits using digital ICs.
	PO1	Moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to understand the functioning of various combinational logic circuits at a moderate level.
	PO2 PO11 PO12	Slightly	Student will be able to apply first principles of mathematics and science to analyze the working of certain combinational logic circuits and can manage to do projects using combinational logic in multidisciplinary environment to a slighter extent and get scope for career development leading to lifelong learning.
CO4	PO3	Substantially	Student will be able to substantially design and implement few sequential logic circuits using digital ICs.
	PO1	Moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to understand the functioning of certain sequential logic circuits at a moderate level.
	PO11 PO12	Slightly	Student will be able to do projects using sequential logic in multidisciplinary environment to a slighter extent and get scope for career development leading to lifelong learning.
CO5	PO5	Substantially	Students will be able to use modern simulation tool like xilinx to substantially analyze the working of various digital circuits by simulation.
	PO3 PO9 PO11	Slightly	Student will be able to use simulation tools to design few digital circuits and do projects individually or in multidisciplinary environment to a slighter extent.
CO6	PO1	Moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to understand the functioning of few D/A converters and ALU at a moderate level.
	PO2 PO3 PO11 PO12	Slightly	Student will be able to apply first principles of mathematics and science to analyze certain D/A converter and ALU and can manage to do projects using D/A converters in multidisciplinary environment to a slighter extent and get scope for career development leading to lifelong learning.

18CSL38-DS LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Solve computational problems using basic C language constructs.	3	3	1	1	1	-	-	-	2	-	-	3	3	1	3	-
CO2	Design and implement operations on both single and Multidimensional arrays.	3	2	3	1	1	-	-	-	1	2	-	3	3	1	2	-
CO3	Develop menu driven programs to demonstrate primitive operations on stacks and queues	3	3	2	1	1	-	-	-	1	2	-	2	3	1	2	-
CO4	Assess the operations on different types of Trees.	3	3	2	-	1	-	-	-	1	2	-	2	3	1	3	-
CO5	Demonstrate traversal techniques on graphs	2	3	2	1	1	-	-	-	1	2	-	2	3	1	3	-
CO6	Apply ap pr opr i a t e data s t r u c t u r e s to solve computing problems	3	2	3	2	2	2	-	1	2	1	2	3	3	1	2	1

CO1	PO	Level	Justification
	PO1, PO2, PO12	Substantially	Knowledge of fundamental maths is essential for computational problems. Sorting techniques needs analysis schemes which in turn needs mathsbackground
	PO9	Moderately	Team work plays vital role while carrying out projects using primitive and non primitive data types.
	PO3, PO4, PO5,	Slightly	Pattern matching and sorting is an integral part of any complex engineering problem The concepts of sorting and pattern matching moderately makes use of research methods. Primitive editing and debugging tools are used.

CO2	PO1, PO3, PO12	Substantially	The knowledge of mathematical principles and basics of computer science will help the students to gain knowledge on arrays and itsoperations.
	PO2, PO10	Moderately	Array concepts are very essential in solving engineering problems.
	PO4, PO5, PO9	Slightly	Applications concerned with cultural, societal and environmental considerations makes use of array and its operation concept.
CO3	PO1, PO2,	Substantially	Understanding of stacks, queues , linked lists is key to solution of many engineering problems. Concepts of stacks, queues and linked lists are important in analyzing various problems.
	PO3,P O10 PO12	Moderately	Design solutions for complex programming applications contain basics of Stacks, queues and linked lists. Any computer based applications require the concepts of stacks, queues and linked list
	PO4, PO5, PO9	Slightly	Analysis, interpretation of data and design of experiments requires extensive knowledge of linked lists. Primitive editing and debugging tools are used. Team work plays vital role while carrying out projects
CO4	PO1, PO2,	Substantially	The knowledge of mathematical principles helps in understanding the basic structure of trees. Primitive operations of trees such as insertion, deletion, traversals are very essential in solving engineering problems.
	PO3,P O10 PO12	Moderately	Tree operations are integral part of any complex engineering problem Concept of trees is found to be used in diverse areas of engineering and technology.
	PO5, PO9	Slightly	Practising project's solution makes use of modelling based on trees. Team work plays vital role while carrying out projects
CO5	PO2	Substantially	Basic Hashing operations are used in solving several engineering problems.
	PO1, PO3, PO10 PO12	Moderately	Mathematical knowledge helps in performing traversals on graphs and random access on files . Applications concerned with cultural, societal and environmental considerations makes use of file and hashing operations. Graph based applications are relevant to broader category of applications
	PO4, PO5, PO9	Slightly	Effective searching techniques can be implemented using hashing and effective storage using files. Practising project's solution makes use of modelling based on graphs and hashing concepts Team work plays vital role while carrying out projects
CO6	PO1, PO3, PO12	Substantially	Knowledge of mathematics and engineering fundamentals are extensively used in designing appropriate data structures to solve engineering problems. Choosing appropriate data structure is essential while designing health based and safety projects

			Most of computer science based projects would need the extensive usage of various data structure
	PO2, PO4, PO5, PO6, PO9, PO11	moderately	Designing solution approach using proper data structures makes extensive use of maths and research literature. Data structures is primary component in solving research based problems. Usage of modern IT tools helps in understanding the working of complex data structures. Team work plays vital role while carrying out projects using heterogeneous data structures Team work plays vital role while carrying out projects manage projects in multidisciplinary environments
	PO8, PO10	slightly	Ethics in programming must be inculcated in engineering practice. Documentation is maintained.

CO	**PSO**	**LEVEL**	**Justification**
CO1	PSO1, PSO3	substantially	Various data structures and their primitive operations are crucial in Computer Science based projects Pattern matching and sorting is an integral part of any complex engineering problem
	PS02	slightly	Sorting techniques needs analysis schemes which in turn needs maths background
CO2	PSO1	substantially	Sorting and pattern classification makes extensive usage of Maths
	PSO3	moderately	The concepts of sorting and pattern matching are integral part of most of computer based projects and courses.
	PSO2	slightly	
CO3	PSO1	substantially	Understanding of stacks, queues , linked lists is key to solution of many engineering problems
	PSO3	moderately	Concepts of stacks, queues and linked lists are vital in post graduate courses/projects
	PSO2	slightly	Concepts of stacks, queues and linked lists are important in analyzing various problems.
CO4	PSO1, PSO3	substantially	The knowledge of mathematical principles helps in understanding the basic structure of trees. Tree operations are integral part of career of a computer science graduate .
	PSO2	slightly	Primitive operations of trees such as insertion, deletion, traversals are very essential in solving engineering problems.
CO5	PSO1, PSO3	moderately	Mathematical knowledge helps in performing traversals on graphs and random access on files . Applications concerned with cultural, societal and environmental considerations makes use of file and hashing operations.
	PSO2	slightly	Graph traversals and hashing needs the knowledge of different subjects like maths, graph theory and algorithmic techniques.Graph based applications are relevant to broader category of applications
CO6	PSO1	substantially	Knowledge of mathematics and engineering fundamentals are extensively used in designing appropriate data structures to solve engineering problems.
	PSO3	moderately	Data structures is the core stream of computer science and is widely used in most of the computer science based projects

	PSO2, PSO4	slightly	Choosing appropriate data structure and designing IT systems needs the exposure to modern tool usage. Ethics and integrity in designing/programming must be inculcated in engineering practice.

18CS32 -DATA STRUCTURE AND APPLICATIONS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate and classify various data structures and their primitive operations	2	1										1	2			
CO2	Apply the concepts of arrays and strings in sorting and pattern matching applications	3	3	3	2	1							1	3		1	
CO3	Implement the operations of linear data structures like stacks, queues and linked lists.	3	3	2	2	2							1	3	1	1	
CO4	Demonstrate primitive operations on different types of trees and their applications	3	3	2	2	2							1	3	1	1	
CO5	Summarize the concepts of graphs, traversal techniques, hashing and file handling.	2	2	2	2	3							1	3	1	1	1
CO6	Design and develop solutions approaches to solve various computing problemsb y choosing appropriate data structures	3	3	3	3	3			1	1			2	2	3	3	1

CO1	PO	Level	Justification
	PO1	Moderately	The knowledge of mathematical principles and basics of computer science will help the students to classify various data structures and their primitive operations.
	PO2	Slightly	
	PO12	Slightly	The knowledge of research and natural science does not contribute the stated CO; Data Structures is part of any programming based applications.
CO2	PO1	Substantially	Knowledge of fundamental maths is essential for pattern matching ans sorting techniques.
	PO2	Substantially	Sorting techniques needs analysis schemes which in turn needs maths background Pattern matching
	PO3	Substantially	and sorting is an integral part of any complex engineering problem
	PO4	Moderately	The concepts of sorting and pattern matching moderately makes use of research methods. Primitive
	PO5	Slightly	editing and debugging tools are used.
	PO12	Slightly	Pattern matching and sorting is an integral part of any engineering problem

CO3	PO1	Substantially	Understanding of stacks, queues , linked lists is key to solution of many engineering problems
	PO2	Substantially	Concepts of stacks, queues and linked lists are important
	PO3	Moderately	Design solutions for complex programming applications contain basics of Stacks, queues and linked lists. Analysis,
	PO4	Moderately	interpretation of data and design of experiments requires extensive knowledge of linked lists.
	PO5	Moderately	Primitive editing and debugging tools are used.
	PO12	Slightly	Any computer based applications require the concepts of stacks, queues and linked list
CO4	PO1	Substantially	The knowledge of mathematical principles helps in understanding the basic structure of trees.
	PO2	Substantially	Primitive operations of trees such as insertion, deletion, traversals are very essential in solving engineering problems. Tree operations
	PO3	Moderately	are integral part of any complex engineering problem
	PO4	Moderately	Research oriented projects require the data to be represented in tree format Practising
	PO5	Moderately	project's solution makes use of modelling based on trees.
	PO12	Slightly	Concept of trees is found to be used in diverse areas of engineering and technology.
CO5	PO1	Moderately	Mathematical knowledge helps in performing traversals on graphs and random access on files . Basic
	PO2	Moderately	Hashing operations are used in solving several engineering problems.
	PO3	Moderately	Applications concerned with cultural, societal and environmental considerations makes use of file and hashing operations. Effective
	PO4	Moderately	searching techniques can be implemented using hashing and effective storage using files.
	PO5	Slightly	Practising project's solution makes use of modelling based on graphs and hashing concepts Graph
	PO12	Slightly	based applications are relevant to broader category of applications
CO6	PO1	Substantially	Knowledge of mathematics and engineering fundamentals are extensively used in designing appropriate data structures to solve engineering
	PO2	Substantially	problems.
	PO3	Substantially	Designing solution approach using proper data structures makes extensive use of maths and research literature. Choosing
	PO4	Substantially	appropriate data structure is essential while designing health based and safety projects
	PO5	Substantially	Data structures is primary component in solving research based problems.
	PO8	Slightly Slightly	Usage of modern IT tools helps in understanding the working of complex data structures. Ethics in
	PO9	Moderately	programming must be inculcated in engineering practice.
	PO12		Team work plays vital role while carrying out projects using heterogeneous data structures
			Most of computer science based projects would need the extensive usage of various data structure

CO1	**PSO**	**Level**	**Justification**
	PSO1	Moderately	Various data structures and their primitive operations are crucial in Computer Science based projects

CO2	PSO1	Substantially	Sorting and pattern classification makes extensive usage of Maths
	PSO3	Slightly	The concepts of sorting and pattern matching are integral part of most of computer based projects and courses.
CO3	PSO1	Substantially	Understanding of stacks, queues , linked lists is key to solution of many engineering problems
	PSO2	Slightly	Concepts of stacks, queues and linked lists are vital in post graduate courses/projects
	PSO3	Slightly	
CO4	PSO1	Substantially	The knowledge of mathematical principles helps in understanding the basic structure of trees.
	PSO2	Slightly	Primitive operations of trees such as insertion, deletion, traversals are very essential in solving engineering
	PSO3	Slightly	problems. Tree operations are integral part of career of a computer science graduate .
CO5	PSO1	Substantially	Mathematical knowledge helps in performing traversals on graphs and random access on files .
	PSO2	Slightly	Graph traversals and hashing needs the knowledge of different subjects like maths, graph theory and algorithmic
	PSO3	Slightly	techniques. Graph based applications are relevant to broader category of applications
	PSO4	Slightly	
CO6	PSO1	Moderately	Knowledge of mathematics and engineering fundamentals are extensively used in designing appropriate data structures to solve engineering
	PSO2	Substantially	problems. Choosing appropriate data structure and designing IT systems needs the exposure to modern tool usage. .
	PSO3	Substantially	Data structures is the core stream of computer science and is widely used in most of the computer science based
	PSO4	Slightly	projects Ethics and integrity in designing/programming must be inculcated in engineering practice.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS33 -ANALOG & DIGITAL ELECTRONICS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Analyse the performance of FETs, Opamp circuits and their applications.	2	2	2	-	-	-	-	-	-	-	1	1	2	-	-	-
CO2	Apply simplification (SOP/POS) techniques to combinational logic circuits/expressions.	3	2	3	2	1	-	-	-	-	-	1	-	2	1	1	-
CO3	Analyze and design various data processing circuits .	3	3	2	2	-	-	-	-	-	-	1	1	2	2	1	-
CO4	Realize the working of various flip flops and their applications.	2	2	2	2	-	-	-	-	-	-	1	1	2	1	1	-
CO5	Interpret and analyze the performance of A/D and D/A converters.	2	1	1	-	-	-	-	-	-	-	-	1	1	1	1	-
CO6	Implement logic circuits using HDL models	2	-	-	1	2	-	-	-	-	-	-	1	1	2	-	-

CO1	PO	Level	Justification
	PO1 PO2 ,PO3	Moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to moderately understand the working of FETs and Opamp circuit to analyse their performance. Also provide design solution for the given specification for certain applications.
	PO11 ,PO12	Slightly	Students can manage to do projects using opamps in multidisciplinary environment to a slighter extent and provides scope for career development leading to lifelong learning.

CO2	PO1 ,PO3	Substantially	The knowledge of mathematical principles and basics of science will help the students to apply the same to substantially understand the simplification techniques pertaining to combinational logic and will be able to design logic circuits for the given SOP POS function.
	PO2, PO4	Moderately	Student will be able to apply first principles of mathematics and science to moderately analyse and verify the combinational logic problems.
	PO5 ,PO11	Slightly	Students can use modern tools to simulate combinational logic circuits and manage to do projects using combinational logic in multidisciplinary environment to a slighter extent.
CO3	PO1 PO2	Substantially	The knowledge of mathematical principles and basics of science will help the students to apply the same to substantially analyze certain data processing circuits
	PO3 PO4	Moderately	Student will be able to apply first principles of mathematics and science to design few data processing circuits to a moderate extent and also can verify certain design problems pertaining to few data processing circuits.
	PO11 PO12	Slightly	Students can manage to do projects using data processing circuits in multidisciplinary environment to a slighter extent and get scope for career development leading to lifelong learning.
CO4	PO1 PO2 PO3 PO4	Moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to moderately understand and verify the working of various flip flops, analyze their functionality in certain applications like registers and counters and will be able to design sequential circuits for the given specification to a moderate extent.
	PO11 PO12	Slightly	Students can manage to do projects using sequential logic circuits in multidisciplinary environment to a slighter extent and get scope for career development leading to lifelong learning.
CO5	PO1	Moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to moderately analyze the performance of certain A/D and D/A converters.
	PO2 PO3, PO12	Slightly	Student will be able to apply first principles of mathematics and science to analyze the working of certain A/D and D/A converters and also design few A/D converters to do projects in multidisciplinary environment to a slighter extent.
CO6	PO1 PO5	Moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to moderately understand the various HDL models and implement certain logic circuits using VHDL/Verilog HDL aided by modern simulation tools like xilinx.
	PO4 PO12	Slightly	Student will be able to verify certain HDL models for few problems pertaining to digital circuits and get scope for

			career development leading to lifelong learning.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS34 -COMPUTER ORGANIZATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Visualize the basic building blocks of computer.	3											2	3		2	
CO2	Analyze the programs as sequence of machine instructions.	3	2										2	2			
CO3	Explore different ways of communicating with I/O devices and interfaces.	3											2	2			
CO4	Design and evaluate the performance of memory systems.	3	2	3	1								1	3	2	1	
CO5	Demonstrate arithmetic and logical operations with integer and floating point operands.	3	3	3	2	1							1	3	2		
CO6	Analyze the basic functional units of processor.	3	2	3	1								1	3	2	2	

CO1	PO	Level	Justification
	PO1	Substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and analyse its performance .

	PO12	Moderately	Performance analysis helps the students to gain the research based knowledge and life-long learning.
CO2	PO1	Substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and to generate the basic assembly language code.
	PO2 PO12	Moderately	Students are able to encode the machine instructions and its memory requirement and to apply the same in life long learning.
CO3	PO1	Substantially	The knowledge of basics of computer science will help the students to understand the communication between processor and I/O devices.
	PO12	Moderately	Students are able to analyze the bus structure and its applications.
CO4	PO1 PO3	Substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and to exploit cache performance and also enables students to design memory of different organizations.
	PO2	Moderately	Performance of processor is analyzed theoretically using various cache coherence protocols and replacement algorithms.
	PO4, PO12	Slightly	Students will learn how to improve the cache miss and cache miss penalty and to apply the same in life long learning.
CO5	PO1, PO2 PO3	Substantially	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and to increase the performance of processor using carry save adder, fast multiplication.
	PO4	Moderately	Students are able to analyze the problems on Booth's algorithm by increasing the number of bits.
	PO5, PO12	Slightly	Students are able to solve the problems using simulators.
CO6	PO1, PO3	Substantially	The knowledge of basics of computer science will help the students to understand the working of processor and the generation of control signals..
	PO2	Moderately	Students are able to analyse the microroutine.
	PO4, PO12	Slightly	Students gain knowledge on microcontrollers.

CO	PSO	LEVEL	Justification
CO1	PSO1	Substantially	Students will get solid foundation in the principles and practices of computer science, including mathematics, science and basic engineering.

	PS03	Moderately	After gaining the knowledge in fundamentals, students will be prepared for their careers in the software industry or pursue higher studies and continue to develop their professional knowledge.
CO2	PSO1	Moderately	Students are able to write assembly language programs
CO3	PSO1	Moderately	Students are able to understand how I/O devices communicate within the system.
CO4	PSO1	Substantially	Students are able to analyze the memory system.
	PSO2	Moderately	Students are able to analyze flip flops, inverters and also virtual memory organization
	PSO3	Slightly	After learning memory systems, students can continue to excel their career in hardware .
CO5	PSO1	Substantially	The graduates will have solid foundation in the principles and practices of computer science, including mathematics, science and basic engineering.
	PSO2	Moderately	Will get skills to work on arithmetic operations.
CO6	PSO1	Substantially	The knowledge of basics of computer science will help the students to understand the working of processor and the generation of control signals..
	PSO2	Moderately	Students are able to analyse the microroutine using microprogrammed control unit..
	PSO3	Moderately	Analyze the working of microcontrollers.

18CS35 - Software Engineering

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Assess professional and ethical responsibility, software engineering principles and activities involved in building large software programs.	1					3		3	1	1		2	1	1	2	3
CO2	Demonstrate the process of requirements gathering, classification, specification and validation.	1			2	1	2		1	2	2		2	1	2	2	1
CO3	Outline the concepts of object-oriented and modeling	1											3	2		2	1
CO4	Design models for software system, component and process within realistic constraints.	2	1	3	3	2	1	1	1	2	1	1	2	1	3	2	1
CO5	Apply, design, implement, verify, validate and maintain software systems with metrics	2	2	3	3	1	1	1	1	1	1	1	2	2	2	3	1
CO6	Apply cost estimation and time scheduling for quality project activities.	3	1	2	3	2	1	2	1	2	1	3	3	2	1	2	2

	PO	Level	Justification
CO1	PO1, PO9,	Slightly	The knowledge of Software engineering fundamentals, will help the students to solve of complex engineering problems, function effectively as an individual, and as a member or leader in diverse teams and communicate effectively on complex engineering activities with the engineering community and with society at large.
	PO12	Moderately	Understand the recent developments and life-long learning.
	PO6,	Strongly	Commit to professional ethics and responsibilities

CO2	PO1, PO5, PO8	Slightly	The knowledge of basics of computer science, modern engineering and IT tools, ethical principles will help the students to apply the same and gather requirements
	PO4, P06, P09, PO10, P012	Moderately	Analyze complex engineering problems, apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues in requirements gathering, classification, specification and validation, ability to engage in independent and life-long leaning in the broadest context of technological change and ethically function effectively as an individual, and as a member or leader in diverse teams.
CO3	PO1,	slightly	The knowledge of basics of computer science will help slightly to the students to apply the same and identify various concepts of object-oriented modeling.
	PO12	Strongly	Communicates effectively to students through designing documentation
CO4	PO2, PO6, PO7, P08, PO10,PO11	Slightly	Ethically analyze, apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, communicate effectively on complex engineering activities in Design models for sustainable development of software system and Understand project management.
	PO1, PO5 PO9 POl2	Moderately	Modem design tool usage for software system, component, mem within realistic constraints has been analyzed. Function effectively as an individual, and as a member or leader in diverse teams for system design Understand the recent developments and life-long learning.
	PO3 PO4	Strongly	The knowledge of Software analysis and design helps in development of software solutions
CO5	PO2, PO6 PO8, PO10	Slightly	Ethically analyze cost estimation and time scheduling for quality project activities. By applying engineering knowledge and Communicate effectively on complex engineering project activities
	PO3, PO5 PO7, PO9	Moderately	Using modern tools in project scheduling, design solutions for complex engineering problems and function effectively as an individual: and as a member or leader in diverse teams in sustainable project development.
	PO1, PO4 PO11, PO12	Strongly	The knowledge of basics of computer science, analyze, demonstrate knowledge and understanding of the engineering and management principles. Understand project management and finance.
CO6	PO5, PO6, PO7, PO8 PO9, PO10 PO11	Slightly	Function effectively as an individual and as a member or leader in diverse teams, modem engineering and IT tools used for ethically Analyze, design: implement: verify, validate: maintain software systems with metrics with knowledge to assess societal: health: safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
	PO1, PO2, PO12	Moderately	The knowledge of basics of computer science will help the students to analyze, design, implement, verify, validate, maintain software systems. Understand the recent developments and life-long learning.
	PO3 PO4	Strongly	Analyze and design solutions for complex engineering problems

CO1	PSO	Level	Justification
	PSO, PSO2	Slightly	The knowledge of basics of computer science will help the students to assess professional and ethical responsibility, software engineering principles and activities involved in building large software programs.
	PS03	Moderately	The knowledge of software engineering principles and activities involved in building large software programs helps in student careers in the software industry or pursue higher studies and continue to develop their professional knowledge.
	PSO4	Strongly	The knowledge of professional and ethical responsibility used to practice the profession with ethics, integrity, leadership and social responsibility.
CO2	PS1 PSO4	Slightly	The process of requirements gathering, classification, specification and validation knowledge helps in building solid foundation in the principles and practices of computer science, leadership and social responsibility.
	PSO2 PSO3	Moderately	Requirements gathering skills used to communicate effectively using modem tools and prepare students for careers in the software industry
CO4	PSO1 PSO4	Slightly	The knowledge of computer science used to understand design models for software system, component, process demonstrate leadership and social responsibility.
	PSO3	Moderately	Design knowledge prepare students for their careers in the software industry or to pursue highs studies and continue to develop their professional knowledge
	PSO2	Strongly	Software design skills helps student to function as member of multi-disciplinary teams
CO5	PSO1 PSO3 PSO4	Moderately	The knowledge of basics of computer science will help the students to apply the same and exploit quality project activities, leadership and social responsibility. Prepare students for their careers in the software industry or pursue higher studies and continue to develop their professional knowledge.
	PSO2	Slightly	Cost estimation and time scheduling for quality project activities Skills used to function as members of multi-disciplinary teams and to communicate effectively using modern tools.
CO6	PSO1 PS02	Slightly	The knowledge of basics of computer science will help the students to Analyze, design, implement, verify, validate, maintain software systems. Understand to communicate effectively using modem tools.
	POS4	Moderately	Students learn to practice the profession with ethics, integrity, leadership and social responsibility.
	PSO3	Strongly	Students prepared for their careers in the software industry or pursue highs studies and continue to develop their professional knowledge.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS36 –DISCRETE MATHEMATICAL STRUCTURES

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify the correctness of propositional log and truth tables.	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO2	Make use of counting techniques, mathematical induction, permutations and combinations to solve problems.	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO3	Analyze and develop partial orders, relations and functions.	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO4	Analyze the use of principle of inclusion-exclusion, derangements and recurrence relations	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO5	Analyze and develop types of graphs and trees.	2	1	1	-	-	-	-	-	-	-	-	1	1			

COs	POs	CRL	Justification
CO1	PO1	2	Along with the knowledge of mathematics, the concept of discrete mathematical structures is used for different applications of engineering.
	PO2	1	Discrete mathematical structures are used to identify, formulate and design a mathematical model for many engineering problems.
	PO3	1	The acquired mathematical knowledge is used for design of engineering problems.

	PO12	1	Knowledge of discrete structures is used for application of any chosen area in engineering disciplines for generating a mathematical model.
CO2	PO1	2	Study of logical connectives in discrete structure help in providing the solutions to engineering problems.
	PO2	1	By using with concept of logical connectives different problems are analyzed.
	PO3	1	The correctness of the analysis of the problem is better understood by the logical connectives.
	PO12	1	Knowledge of mathematics is used for application of any chosen area in engineering disciplines for generating a mathematical model.
CO3	PO1	2	The concept of relations and functions are applied to find solutions for some engineering problems.
	PO2	1	The theory of partial order is used to analyze the solutions pertaining to the problems.
	PO3	1	knowledge of Hasse diagram is used to design engineering problems.
	PO12	1	Knowledge of mathematical structures is used for application of any chosen area in engineering disciplines for generating a mathematical model.
CO4	PO1	2	Knowledge of discrete structures like rook polynomials is used in solving domain specific problems.
	PO2	1	Knowledge of discrete structures like recurrence relations is used analyze engineering problems.
	PO3	1	knowledge of derangements is used to design engineering problems.
CO5	PO12	1	Knowledge of the principle of inclusion-exclusion is used for application of chosen area in engineering disciplines for generating a mathematical model.
	PO1	2	The knowledge of group theory is used in various engineering problems.
	PO2	1	The theory of Error detection and error correction codes is used in analysis of engineering problems.
	PO3	1	The concept of group theory to design the solutions for engineering problems.
	PO12	1	Knowledge of trees is used for application of any chosen area in engineering disciplines for generating a mathematical model.

COs	**POs**	**CRLs**	**Justification**
CO1	PSO1	1	The concept of Fundamentals of logic is applied for solving engineering problems.
CO2	PSO1	1	Analysis of problems using combinatorics is done by adapting software development methodology.
CO3	PSO1	1	Concept of relations and functions followed to solve an engineering problem.

CO4	PSO1	1	Specific counting techniques and recurrence relations are used to solve complex engineering problems.
CO5	PSO1	1	The method of Discrete structures such as Graph theory and combinatorics used to understand domain specific initiatives.

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CSL37-ADE LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO 4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Utilize various electronic devices to design and construct the analog circuits	2	2	1	-	-	-	-	-	-	-	1	-	1	-	-	-
CO2	Use simulation package like multisim to design analog circuits.	-	-	1	-	3	-	-	-	1	-	1	-	1	2	-	-
CO3	Use various digital integrated circuits in the design and demonstration of various combinational logic and data processing circuits	2	1	3	-	-	-	-	-	-	-	1	1	3	-	1	-
CO4	Design and demonstrate various types of sequential circuits using flip flops.	2	-	3	-	-	-	-	-	-	-	1	1	2	-	1	-
CO5	Use simulation package like modelsim to design various digital circuits.	-	-	1	-	3	-	-	-	1	-	1	-	1	2	-	-
CO6	Understand the working and implementation of DAC and ALU	2	1	1	-	-	-	-	-	-	-	1	1	1	-	-	-

CO1	PO	Level	Justification
	PO1	Moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to implement

	PO2		few analog circuits and analyze their functionality at a moderate level.
	PO3 PO11	Slightly	Student will be able to design few analog circuits and do projects in multidisciplinary environment to a slighter extent.
CO2	PO5	Substantially	Students will be able to use modern simulation tool like multisim to substantially analyze the working of analog circuits by simulation.
	PO3 PO9 PO11	Slightly	Student will be able to use simulation tools to design few analog circuits and do projects individually or in multidisciplinary environment to a slighter extent.
CO3	PO3	Substantially	Student will be able to substantially design and implement various combinational logic circuits using digital ICs.
	PO1	Moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to understand the functioning of various combinational logic circuits at a moderate level.
	PO2 PO11, PO12	Slightly	Student will be able to apply first principles of mathematics and science to analyze the working of certain combinational logic circuits and can manage to do projects using combinational logic in multidisciplinary environment to a slighter extent and get scope for career development leading to lifelong learning.
CO4	PO3	Substantially	Student will be able to substantially design and implement few sequential logic circuits using digital ICs.
	PO1	Moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to understand the functioning of certain sequential logic circuits at a moderate level.
	PO11 PO12	Slightly	Student will be able to do projects using sequential logic in multidisciplinary environment to a slighter extent and get scope for career development leading to lifelong learning.
CO5	PO5	Substantially	Students will be able to use modern simulation tool like xilinx to substantially analyze the working of various digital circuits by simulation.
	PO3 PO9, PO11	Slightly	Student will be able to use simulation tools to design few digital circuits and do projects individually or in multidisciplinary environment to a slighter extent.
CO6	PO1	Moderately	The knowledge of mathematical principles and basics of science will help the students to apply the same to understand the functioning of few D/A converters and ALU at a moderate level.

	PO2, PO3, PO11, PO12	Slightly	Student will be able to apply first principles of mathematics and science to analyze certain D/A converter and ALU and can manage to do projects using D/A converters in multidisciplinary environment to a slighter extent and get scope for career development leading to lifelong learning.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CSL38-DS LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Solve computational problems using basic C language constructs.	3	3	1	1	1	-	-	-	2	-	-	3	3	1	3	-
CO2	Design and implement operations on both single and Multidimensional arrays.	3	2	3	1	1	-	-	-	1	2	-	3	3	1	2	-
CO3	Develop menu driven programs to demonstrate primitive operations on stacks and queues	3	3	2	1	1	-	-	-	1	2	-	2	3	1	2	-
CO4	Assess the operations on different types of Trees.	3	3	2	-	1	-	-	-	1	2	-	2	3	1	3	-
CO5	Demonstrate traversal techniques on graphs	2	3	2	1	1	-	-	-	1	2	-	2	3	1	3	-
CO6	Apply ap pr opr i a t e data s t r u c t u r e s to solve computing problems	3	2	3	2	2	2	-	1	2	1	2	3	3	1	2	1

CO1	PO	Level	Justification
	PO1, PO2, PO12	Substantially	Knowledge of fundamental maths is essential for computational problems. Sorting techniques needs analysis schemes which in turn needs mathsbackground
	PO9	Moderately	Team work plays vital role while carrying out projects using primitive and non primitive data types.

	PO3, PO4, PO5,	Slightly	Pattern matching and sorting is an integral part of any complex engineering problem The concepts of sorting and pattern matching moderately makes use of research methods. Primitive editing and debugging tools are used.
CO2	PO1, PO3, PO12	Substantially	The knowledge of mathematical principles and basics of computer science will help the students to gain knowledge on arrays and itsoperations.
	PO2, PO10	Moderately	Array concepts are very essential in solving engineering problems.
	PO4, PO5, PO9	Slightly	Applications concerned with cultural, societal and environmental considerations makes use of array and its operation concept.
CO3	PO1, PO2,	Substantially	Understanding of stacks, queues , linked lists is key to solution of many engineering problems. Concepts of stacks, queues and linked lists are important in analyzing various problems.
	PO3,P O10 PO12	Moderately	Design solutions for complex programming applications contain basics of Stacks, queues and linked lists. Any computer based applications require the concepts of stacks, queues and linked list
	PO4, PO5, PO9	Slightly	Analysis, interpretation of data and design of experiments requires extensive knowledge of linked lists. Primitive editing and debugging tools are used. Team work plays vital role while carrying out projects
CO4	PO1, PO2,	Substantially	The knowledge of mathematical principles helps in understanding the basic structure of trees. Primitive operations of trees such as insertion, deletion, traversals are very essential in solving engineering problems.
	PO3,P O10 PO12	Moderately	Tree operations are integral part of any complex engineering problem Concept of trees is found to be used in diverse areas of engineering and technology.
	PO5, PO9	Slightly	Practising project's solution makes use of modelling based on trees. Team work plays vital role while carrying out projects
CO5	PO2	Substantially	Basic Hashing operations are used in solving several engineering problems.
	PO1, PO3, PO10 PO12	Moderately	Mathematical knowledge helps in performing traversals on graphs and random access on files . Applications concerned with cultural, societal and environmental considerations makes use of file and hashing operations. Graph based applications are relevant to broader category of applications
	PO4, PO5, PO9	Slightly	Effective searching techniques can be implemented using hashing and effective storage using files. Practising project's solution makes use of modelling based on graphs and hashing concepts Team work plays vital role while carrying out projects
CO6	PO1, PO3, PO12	Substantially	Knowledge of mathematics and engineering fundamentals are extensively used in designing appropriate data structures to solve engineering problems. Choosing appropriate data structure is essential while designing health based and safety projects
			Most of computer science based projects would need the extensive usage of various data structure
	PO2,	Moderately	Designing solution approach using proper data structures makes extensive use of maths and research literature.

	PO4, PO5, PO6, PO9, PO11		Data structures is primary component in solving research based problems. Usage of modern IT tools helps in understanding the working of complex data structures. Team work plays vital role while carrying out projects using heterogeneous data structures Team work plays vital role while carrying out projects manage projects in multidisciplinary environments
	PO8, PO10	Slightly	Ethics in programming must be inculcated in engineering practice. Documentation is maintained.

CO	**PSO**	**LEVEL**	**Justification**
CO1	PSO1 PSO3	substantially	Various data structures and their primitive operations are crucial in Computer Science based projects Pattern matching and sorting is an integral part of any complex engineering problem
	PS02	slightly	Sorting techniques needs analysis schemes which in turn needs maths background
CO2	PSO1	substantially	Sorting and pattern classification makes extensive usage of Maths
	PSO3	moderately	The concepts of sorting and pattern matching are integral part of most of computer based projects and courses.
	PSO2	slightly	
CO3	PSO1	substantially	Understanding of stacks, queues , linked lists is key to solution of many engineering problems
	PSO3	moderately	Concepts of stacks, queues and linked lists are vital in post graduate courses/projects
	PSO2	slightly	Concepts of stacks, queues and linked lists are important in analyzing various problems.
CO4	PSO1, PSO3	substantially	The knowledge of mathematical principles helps in understanding the basic structure of trees. Tree operations are integral part of career of a computer science graduate .
	PSO2	slightly	Primitive operations of trees such as insertion, deletion, traversals are very essential in solving engineering problems.
CO5	PSO1 PSO3	moderately	Mathematical knowledge helps in performing traversals on graphs and random access on files . Applications concerned with cultural, societal and environmental considerations makes use of file and hashing operations.
	PSO2	slightly	Graph traversals and hashing needs the knowledge of different subjects like maths, graph theory and algorithmic techniques. Graph based applications are relevant to broader category of applications
CO6	PSO1	substantially	Knowledge of mathematics and engineering fundamentals are extensively used in designing appropriate data structures to solve engineering problems.
	PSO3	moderately	Data structures is the core stream of computer science and is widely used in most of the computer science based projects
	PSO3 PSO4	slightly	Choosing appropriate data structure and designing IT systems needs the exposure to modern tool usage. Ethics and integrity in designing/programming must be inculcated in engineering practice.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS51-MANAGEMENT ENTREPRENEURSHIP FOR IT INDUSTRY

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Comprehend Management activities	1		1	1		1	1		1		2	2	1	1	1	1
CO2	Emphasize Entrepreneur concepts and outline their importance in entrepreneurship	1	1	1	2		1	1	1	2		2	1	1	1	2	1
CO3	Apply Enterprise Resource Planning (ERP) solutions for IT industry	3	3	3	3		1	3	1	2		1	1	3	2	3	1
CO4	Propose the methods for establishing micro, small and large scale enterprises	1	2	2	2		1	1	2	1		1	1	1		1	2
CO5	Apply IPRs and institutional support for entrepreneurship	1	1	2	1		1	3	3	1	2	1	2	2		1	2
CO6	Prepare project report for IT industry based on feasibility studies	3	3	3	3		3	3	2	3	3	1	3	3		3	1

CO1	PO	Level	Justification
	PO11 , PO12	Moderately	The management principles and activities enable the students to develop overall personality to work as an individual, team member and further enhance his skills to become a leader.

	PO1,PO3 PO4, PO6 PO7 ,PO9	Slightly	The students will be able to understand concepts of managements activities which enhances behavior , personality and ethically.
CO2	PO4 PO9, PO11	Moderately	The Entrepreneur concepts will enable the students to work individually as a team member and helps to build leadership quality.
	PO1,PO2 PO3, PO6 PO7, PO8 ,PO12	Slightly	The Entrepreneur concepts outlined make the students to understand the basic ethical engineering principles to provide solutions to the problems faced by the people, which will motivate to become entrepreneur.
CO3	PO1,PO2 PO3 PO4, PO7	Highly	The application of ERP will provide solution for complex engineering problems based on investigation done by research through strong science and engineering knowledge ,which is essential for sustainable development.
	PO9	Moderately	The gain knowledge can be applied and useful to multi disciplinary environment.
	PO6,PO8 PO11, PO12	Slightly	The ERP concepts described will enable the students to develop solutions, useful for the society in managing the projects in multidisciplinary environment.
CO4	PO1,PO3 PO4, PO8	Moderately	The proposed methods will enable the students to establish micro, small and large scale enterprises based on engineering principles can be useful to solve complex engineering problems and make them professionals with ethics.
	PO1 ,PO6 PO7 ,PO9 PO11 PO12	Slightly	By the proposed methods the students will be able to understand the basic engineering principles, to establish the enterprises on their own which are beneficial to the society .
CO5	PO7 PO8	Highly	The IPRs will protect the creativity of the minds of the people, which can be utilized for providing an innovative engineering solutions to the society.
	PO3	Moderately	The IPRs will protect the interest of the society at large
	PO10 PO12		
	PO1,PO2 PO4 ,PO6 PO9 ,PO11	slightly	The Institutional support will enable the students to realize and implement the complex engineering problems which are beneficial to the individual and society as a whole.
CO6	PO1,PO2 PO3,PO4 PO6,PO7 PO9 PO10, PO12	Highly	The generation of project reports based on strong engineering domain knowledge in a specific application to provide solutions to complex engineering problems designed which would enable them to take up the career as an industrialist based on feasibility studies.
	PO8	Moderately	The contents of the project reports should be developed ethically.
	PO11	Slightly	The project report should be prepared taking into account of financial aspects.
CO1	**PSO**	**Level**	**Justification**

	PSO1, PSO2 PSO3 ,PSO4	Slightly	The management concepts studied will be the basis for the students to prepare their careers in software industry with ethics, integrity and leadership qualities through basic engineering concepts.
CO2	PSO3	Moderately	The Entrepreneurial concepts and emphasis on their importance will motivate the students to take up the career in software industry and higher studies.
	PSO1 PSO2, PSO4	Slightly	The Entrepreneurial concepts will be helpful for the students to become an entrepreneur with ethics, integrity with social and moral responsibility in software industry through basic engineering principles.
CO3	PSO1 PSO3	Highly	The solid foundations of principles and practices of Computer science and engineering will enable the students to provide effective solutions to solve the problems of IT industry by applying Enterprise Resource Planning (ERP) concepts.
	PSO2	Moderately	The knowledge gained by Enterprise Resource Planning (ERP) concepts will enable the students to communicate and develop the skills in multi disciplinary environment.
	PSO4	Slightly	The ERP concepts may encourage the students may take up this as a profession .
CO4	PSO4	Moderately	The proposed methods of micro, small and large scale enterprises will enable the students to set up these industries which enhances their leadership qualities with ethics and social responsibility.
	PSO1 ,PSO3	Slightly	The establishing of micro, small and large scale enterprises requires knowledge of basic engineering principles to take up as career in software industry.
CO5	PSO1 ,PSO4	Moderately	The knowledge of Computer science and engineering and IPR are essential to practice the profession with ethics, integrity, leadership and social responsibility. Apply IPRs and institutional support for entrepreneurship
	PSO3	Slightly	The institutional support may facilitate the students to become an entrepreneur in IT industry
CO6	PSO1 ,PSO3	Highly	The knowledge of principles and practices of Computer science and engineering will enable the students to prepare the project report and become entrepreneur in IT industry after thorough feasibility studies. Prepare project report for IT industry based on feasibility studies
	PSO4	Slightly	The preparation of project report for IT industry based on feasibility studies should be done with ethics, integrity and social responsibility

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS52-COMPUTER NETWORKS AND SECURITY

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate the principles of application layer protocols.	3	2	1			1	1					2	3	1	2	
CO2	Distinguish transport layer services and protocols.	3	3	2	2	3	1	1					2	3	1	2	
CO3	Classify IP and Routing Algorithms in network layer.	3	3	2	3	3	1	1					2	3	2	2	
CO4	Demonstrate the basic concepts of network Security.	2	1		2	3	1	1					3	2	1	3	
CO5	Exemplify Network support for multimedia.	1			1		1	1					1	1	1	2	
CO6	Illustrate the basic concepts of VOIP.				1		1						1			1	

CO1	PO	Level	Justification
	PO1	Strongly	The knowledge of strong basics of mathematical and engineering principles help students to demonstrate the principles of application layer protocols.
	PO2 ,PO12	moderately	Analysis of application layer protocols help students to understand the existing system. Life long learning required to bring in the new developments in the upcoming applications
	PO3 PO6 ,PO7	slightly	Development of any new application layer protocol needs analysis and design procedures of new protocol and understanding the impact on societal and environmental contexts
CO2	PO1 , PO2 PO5	Strongly	The knowledge of strong basics of mathematical and engineering principles help students to demonstrate the applications and services of transport layer protocols. Analysis skills required are mandatory whenever deciding the relevant protocol that should be

			configured for any application. Tools like NS3 help students and to realize the working of protocols.
	PO3 ,PO4 PO12	Moderately	It helps students to come up with design strategies and arriving at solutions for the complex problems
	PO6 ,PO7	Slightly	Networking concepts are applied in various domains and hence it is relevant relate transport layer services to understand the impact of the professional engineering solutions in societal and environmental contexts
CO3	PO1 ,PO2 PO4 ,PO5	Strongly	The knowledge of strong basics of mathematical and engineering principles help students to demonstrate the Network layer protocols. Analysis skills required are mandatory whenever deciding the relevant protocol that should be configured for any application and also for debugging complex problems. Tools like NS3 help students and to realize the working of protocols.
	PO3, PO12	Moderately	It helps students to come up with design strategies of any modifications required and induces life long learning
	PO6 ,PO7	Slightly	Networking concepts are applied in various domains and hence it is relevant to relate network layer services to understand the impact of the professional engineering solutions in societal and environmental contexts
CO4	PO5, PO12	Strongly	Networking concepts are applied in various domains in day to day activities and hence induces life long learning. Tools like NS3 help students and to realize the working of protocols.
	PO1 .,PO4	Moderately	The knowledge of strong basics of mathematical and engineering principles help students to demonstrate the principles of application layer protocols. It enables student in Debugging solutions for complex problems.
	PO2, PO6 PO7	Slightly	Network Security concepts are widely used in various domains. Analysis skills will help students to understand its impact in societal and environmental contexts.
CO5	PO1, PO4 PO6 PO7, PO12	Slightly	The knowledge of basics of mathematical and engineering principles and debugging help students to demonstrate streaming and working of Distribution servers. Frequent upgrades of Distribution servers is inducing life long learning. Multimedia networking is multidisciplinary and regular updates in the domain leads to life long learning.
CO6	PO4, PO6 PO12	Slightly	VOIP concepts are multidisciplinary and regular updates in the domain leads to life long learning.

CO1	**PSO**	**Level**	**Justification**
	PSO1	Strongly	The knowledge of strong basics of mathematical principles and computer architecture will help the students to apply and identify functionalities of different application layer protocols.
	PSO3	Moderately	Development of any new application in multidisciplinary environment requires longevity of learning
	PSO2	Slightly	Networking concepts are applied in various domains and hence students will gain skills to function as members of multi-disciplinary teams

CO2	PSO1	Strongly	The knowledge of strong basics of mathematical principles and computer architecture will help the students to apply and identify functionalities of different transport layer protocols.
	PSO2	moderately	Networking concepts are applied in various domains and hence students will gain skills to function as members of multi-disciplinary teams
	PSO3	slightly	Transport layer services are required to establish communication and hence lifelong learning is necessary
CO3	PSO1	Strongly	The knowledge of strong basics of mathematical principles and computer architecture will help the students to identify and apply functionalities of different network layer protocols.
	PSO2 PSO3	moderately	Development of any new network layer protocol needs the understanding of its working in multidisciplinary environment and requires longevity of learning
CO4	PSO3	Strongly	Network Security concepts are mandatory in almost every networking application in day to day activities and hence induces life long learning.
	PSO1	moderately	The knowledge of strong basics of mathematical and engineering principles help students to demonstrate the principles of application layer protocols. It enables student in Debugging solutions for complex problems.
	PSO2	slightly	Mobile networks are used in various domains and hence students will gain an . students will gain skills to function as members of multi-disciplinary teams
CO5	PSO3	moderately	Frequent upgrades of Distribution servers induces life long learning.
	PSO1 PSO2	slightly	The knowledge of mathematical principles and basics of computer science will help the students to understand the concepts of CDNs.
CO6	PSO3	slightly	VOIP concepts are multidisciplinary and regular updates in the domain leads to life long learning.

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS53-DATABASE MANAGEMENT SYSTEM

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Represent database with different data modeling concepts.	2	-	2	-	-	-	-	-	1	-	-	1	3	1	1	-
CO2	Design simple database systems.	3	2	3	2	-	-	1	-	1	-	-	2	2	1	1	-
CO3	Use Structured Query Language (SQL) for building and manipulating database.	2	1	1	1	3	-	-	-	2	-	-	3	3	3	3	-
CO4	Develop application to interact with databases.	1	-	3	1	3	-	1	1	2	-	-	2	2	3	2	1
CO5	Analyze and apply normalization for better database design.	2	2	2	2	-	-	-	-	-	-	-	2	2	1	2	-
CO6	Demonstrate the use of concurrency control and transaction processing.	1	-	1	2	2	-	1	1	1	-	-	2	2	2	2	1

CO1	PO	Level	Justification
	PO1 PO3	Moderately	Fundamental knowledge of mathematics, science, engineering are used by students to represent database with different data modeling concepts and design solutions for complex engineering problems.
	PO9 PO12	Slightly	Students are able to function effectively as an individual and team and engage in independent and life-long learning.
CCO 2	PO2 PO4 PO12	Moderately	Students are able to Identify, formulate,analyze complex engineering problems by designing simple database design and conduct investigations. Engage in independent and life-long learning.

	PO7 PO9	Slightly	Design simple database systems by applying ethical principles and commit to professional ethics and responsibilities and Function effectively as an individual and team.
	PO1 PO3	Substantially	To design and develop database system student apply Fundamental knowledge of mathematics, science, engineering
CO3	PO1 PO9	Moderately	Students can Build and manipulate database using SQL by applying fundamental knowledge of engineering and work in team and as individuals
	PO5 PO12	Substantially	Student use modern tools to build and manipulate database. Engage in independent and life-long learning.
	PO2 PO3 PO4	Slightly	Using SQL students can identify,formulate and design solutions for complex engineering problems.
CO4	PO1 ,PO4 PO7 PO8	Slightly	Students can design and develop database applications by applying fundamental knowledge of mathematics, science, engineering using modern tools for sustainable development. Ethics to be practiced in design and development.
	PO9 PO12	Moderately	Students can design and develop database applications individually or in team,it is a life long learning process in context of technological change.
	PO3 PO5	Substantially	Design solutions for complex engineering problems using modern tools.
CO5	PO1,PO2 ,PO3 PO4 PO12	Moderately	Analyze and apply normalization for better database design and development.by applying fundamentals of mathematics, science, and engineering in the context of changing technology.
CO6	PO1 PO3 PO7 PO8 PO9	slightly	Demonstrate the use of concurrency control and transaction processing by applying fundamental knowledge for real world problems with transparency in societal and environmental contexts.
	PO4 PO5 PO12	moderately	Using database tools to achieve concurrency,database consistency for real world problems.

CO1	**PSO**	**Level**	**Justification**
	PSO1	moderately	Graduates of the Program will have solid foundation in Represent database with different data modeling concepts.

	PSO2 PSO3	slightly	The graduates of the Program will have skills to function as member of database development team and to perform effectively in the software industry
CO2	PSO1	moderately	The graduates of the Program will have solid foundation to design simple database systems.
	PSO2 PSO3	slightly	The graduates of the Program will have skills to function as member of database development team and to perform effectively in the software industry
CO3	PSO1 PSO2 PSO3	Substantially	The graduates of the Program will have solid foundation in the principles and practices of database development in the software industry and to communicate effectively using modern tools.
CO4	PSO1 PSO3	moderately	The graduates of the Program will have solid foundation for design and development of database applications in the software industry
	PSO2	Substantially	The graduates of the Program will have skills to function as members of multi-disciplinary teams and to communicate effectively using modern tools for development of database applications.
	PSO4	slightly	The graduates of the program will practice the profession with ethics and integrity
CO5	PSO1 PSO3	moderately	The graduates of the Program will have solid foundation to Analyze and apply normalization for better database design in the software industry
	PSO2	slightly	The graduates of the Program will have skills to function as members of database development team byapply normalization for better database design using modern tools.
CO6	PSO1 PSO2 PSO3	moderately	The graduates of the Program will have solid foundation to implement concurrency control and transaction processing in database development process.
	PO4	slightly	The graduates of the program will practice the profession with ethics to achieve transparency in database transactions.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS54-AUTOMATA THEORY & COMPUTABILITY

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation	3	3	3	2								2	3	1		-
CO2	Translate between different models of Computation	2	3	3	2								2	2	2		-
CO3	Design Grammars and Automata for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.	2	2	2	2			1					1	2	2	2	-
CO4	Apply rigorously formal mathematical methods to prove properties of languages, grammars and automata	2	2	2	2			1					1	2	2	2	
CO5	Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness.	2	1	1	3								2			2	
CO6	Classify a problem with respect to different models of Computation	2	1	1	1								2			2	

CO1	PO	Level	Justification
	PO1 PO2 PO3	Substantially	Knowledge of mathematics, engg fundamentals will help the student to identify ,formulate And analyze to develop engg. Problems.

	PO4 PO12	Moderately	Core concepts help students to design,analyze and interpret the data and to model any real time problem.
CO2	PO1 PO4 PO12	Moderately	Apply of engg. Fundamentals helps students to synthesize model translation which helps for real time situation.
	PO2 PO3	Substantially	Identify, formulate and design solution for different models translation.
CO3	PO1, PO2 PO3 ,PO4	Moderately	Identify, formulate and design solution for research based problems using grammars and automata.
	PO7 PO12	Slightly	Mathematical model of automata and grammars are required for real-time solutions.
CO4	PO1 , PO2 PO3 ,PO4	Moderately	Identify,formulate,design solution for research problems using properties of automata and grammars.
	PO7 PO12	Slightly	Mathematical model of automata and grammars are required for real-time solutions.
CO5	PO1 PO12	Moderately	Knowledge of mathematics and basics of computer will help the students to build reduced formal models.
	PO2 PO3	Slightly	Identify and design solution to reduce the formal models.
	PO4	Substantially	Complex problems are analyzed using formal models.
CO6	PO1 PO12	Moderately	Engg. Fundamentals help students for real-time problems.
	PO2, PO3 PO4	Slightly	Identify formulate design solutions for research based problems using different models of computation.

	PSO	**Level**	**Justification**
CO1	PSO1	Substantially	Fundamental understanding of the core concepts in automata theory and Theory of Computation will give solid foundation.
	PSO2	Slightly	Fundamental understanding of the core concepts in automata theory and Theory of Computation will give skills in multi-disciplinary teams and to communicate effectively using modern tools
CO2	PSO1 PSO2	Moderately	Translation between different models will give solid foundation and skills in multi-disciplinary teams.
CO3	PSO1 PSO2, PSO3	Moderately	Designing Grammars and Automata will give solid foundation ,skills in multi-disciplinary teams and can pursue higher studies in theory of computation or formal modelling.
CO5	PSO3	Moderately	Developing skills in formal reasoning will help students to pursue higher studies in theory of computation or formal modelling.

CO6	PSO3	Moderately	Classifying a problem with respect to different models of Computation will give idea to pursue higher studies in theory of computation or formal modelling.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS55 –APPLICATION DEVELOPMENET USING PYTHON

	Course Outcomes	Program Outcomes											Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Learn the syntax and semantics of Python programming language.	2	2	3		2							2	2	1	2	
CO2	Illustrate the process of structuring the data using lists, tuples and dictionaries.	2	2	3		2				1			2	2	1	2	
CO3	Demonstrate the use of built-in functions to navigate the file system.	2	2	3		2				1			2	2	1	2	
CO4	Implement the Object Oriented Programming concepts in Python.	2	2	3		2				1			2	2	1	3	
CO5	Appraise the need for working with various documents like Excel, PDF, Word and Others.	2	2	3	1	2		1		1	1	1	2	2	2	3	2
CO6	Demonstrate Web scrapping for different types of data.	2	2	3	1	2		1	2	1	1	1	2	2	2	3	2

CO1	PO	Level	Justification
	PO1, PO2 PO5 , PO12	Moderately	Students will be able to apply the knowledge of engineering fundamentals to understand the Syntax and Semantics of Python Scripting
	PO3	Strongly	Help students to recognize and solve real world problems using Python Programming

CO2	PO1, PO2 PO5 ,PO12	Moderately	Students can apply the knowledge of engineering fundamentals to use the Python collection and built in data structures
	PO3	Strongly	Use of Python data structures to meet the specified needs and engage in independent and life-long learning.
	PO9	Slightly	The Python Basic and collection Data Structures help students to analyze engineering problems using modern engineering and IT tools, this also helps to be a member or leader in diverse teams and apply these to one's own work.
CO3	PO1,PO2 PO5 , PO12	Moderately	Graduates can apply the knowledge of engineering fundamentals to write Python Scripts to interact with files and operating Systems
	PO9	Slightly	Python Scripts related to Interaction with files used in research and helps student to be a member or leader in diverse teams.
	PO3	Strongly	Graduates can use Python File Handling in Project management
CO4	PO1,PO2 PO5 , PO12	Moderately	Graduates can apply the knowledge of OOP Concepts in Design/development of solutions using modern engineering and IT tools, it also helps them to engage in independent and life-long learning.
	PO11	Slightly	Knowledge of OOP Concepts helps analyzing engineering problems and can be used in research. This helps them to be a member or leader in diverse teams.
	PO3	Strongly	OOP Concepts can be used by member and leader in a team to develop and manage projects
CO5	PO1, PO2 PO5 , PO12	Moderately	Students can apply the knowledge of PDF and Excel to retrieve contents from websites that meet the specified needs using modern engineering and IT tools.
	PO4 ,PO7 PO9 ,P10 PO11	Slightly	The knowledge of working with PDF and Excel files help students to analyze engineering problems.
	PO3	Strongly	The interaction with CSV files helps to perform data preprocessing.
CO6	PO1,PO2 PO5,PO8 PO12	Moderately	Students can apply the knowledge of Web Scrapping to retrieve contents from websites that meet the specified needs using modern engineering and IT tools.
	PO3	Strongly	Graduates can apply the knowledge of Web Scrapping in Data Analytics and extract useful patterns from data.

	PO4 PO7 PO9 PO10 PO11	Slightly	Knowledge of Web Scrapping helps to analyze web contents and can be used in research.

18CS56-UNIX PROGRAMMING

CO		PO1	PO2	PO3	PO 4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Explain fundamentals of Unix operating system and File organization	1											1	1	1	1	
CO2	Analyze file attribute and shell interpretive life cycle	2	2	3	2	2							2	2	1	3	
CO3	Design and develop programs using shell scripting	3	3	3	2	2							2	2	1	3	
CO4	Examine Unix file APIs and Environment of Unix process	3	3	3	2	2							2	2	1	3	
CO5	Assess the importance of IPC methods and shared memory in UNIX	2	3	3	2	2							2	2	1	3	
CO6	Evaluate the importance of signals and daemon processes.	3	3	3	2	2							2	2	1	3	

CO	PO	Level	Justification
CO1	PO1, PO12	Slightly	Basic concepts will help the students to understand the concepts of OS easily and to Understand and involve in life-long learning for knowledge enhancement.
CO2	PO1, PO2, PO4, PO5, PO12	Moderately	The basic knowledge will help the students to understand the concepts easily and solve various problems.
	PO3	Substantially	Complex problems can be solved using complex tools like grep and bc
CO3	PO1, PO2, PO3	Substantially	Analyzing the problem and generating solutions for the same using shell scripting syntax's.

	PO4, PO5, PO12	Slightly	Solution generated and tools learned will be used throughout the development process.
CO4	PO1, PO2, PO3	Substantially	Acquainting with API's and using it effectively to provide solutions for system programs in unix environment. The same will be extended to provide a facility in unix os.
	PO4, PO5, PO12	Slightly	Modern tools and commands can be used to monitor the time complexity and space complexity of the API's and the new facility that will be generated by the same.
CO5	PO1, PO4, PO5, PO12	Moderately	Inter process communication such as message queues and semaphores will be used to understand the complex communication API's that are used in current trends.
	PO2, PO3	Substantially	Solutions can be provided for different area's in society
CO6	PO1, PO2, PO3	Substantially	Basic working nature of daemon and signals will be thoroughly understood
	PO4, PO5, PO12	Moderately	Solution generated and tools learned will be used throughout the development process.

CO	PSO	Level	Justification
CO1	POS1, POS3	slightly	The knowledge of unix architecture will help students to have solid foundation about OS which will help in there career in software industry
CO2	PSO1	slightly	Information about commands and its working will help the students to per sue career in the industry.
	PSO2	moderately	The working knowledge of various editors will give a basic idea that is required in the programming
	PSO3	substantially	Shell exposure will provide the knowledge about unix OS and its interpretation of commands
CO3	PSO1	slightly	Will provide complete knowledge about scripting to develop a career
	PSO2	moderately	Shell exposure will provide the knowledge about unix OS and its interpretation of commands
	PSO3	substantially	Process of life cycle will give knowledge about internal working of OS
CO4	PSO1	slightly	The working knowledge of various editors will give a basic idea that is required in the programming
	PSO2	moderately	Will provide complete knowledge about scripting to develop a career
	PSO3	substantially	Shell exposure will provide the knowledge about unix OS and its interpretation of commands
CO5	PSO1	slightly	Process of life cycle will give knowledge about internal working of OS

	PSO2	moderately	The working knowledge of various editors will give a basic idea that is required in the programming
	PSO3	substantially	Working of filters will provide idea about data extraction and filtering
CO6	PSO1	slightly	Information about commands and its working will help the students to per sue career in the industry.
	PSO2	moderately	The working knowledge of various editors will give a basic idea that is required in the programming
	PSO3	substantially	Process of life cycle will give knowledge about internal working of OS

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

JUSTIFICATIONS FOR CO -POs & PSOs MAPPING: COMPUTER NETWORKING LAB (18CSL57)

	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate error detection technique using CRC	2	3	1	2						2	1	2	2	1	1	
CO2	Analyze and compare different routing protocols	2	2	1	2						2	1	2	2	1	1	
CO3	Implement connection-oriented and connection-less protocols in the network	2	2	1							2	1	2	2	1	1	
CO4	Demonstrate security features in networks using RSA algorithm	2	2	1	2				1		2	1	2	2	1	1	1
CO5	Analyze techniques to avoid congestion in the network	2	2	1	2						2	1	2	1	1	1	1
CO6	Implement, analyze and evaluate networking protocols using NS3 Tool	2	1			2					1		1	1	1		

	PO	Level	Justification
CO1	PO2	Substantial	The students can able to understanding algorithm, code implementation and demonstration
	PO3, PO11	Slight	Design and development on real network will be complex process
	PO1, PO4 P10 ,P12	Moderate	Complex problems in networking , analysis and interpretation in research methods

CO2	PO1, PO2 PO4 ,PO10 P12	Moderately	Student required knowledge and presentation skills for designing solution for routing problems in computer networking
	PO3 ,PO11	Slight (Low)	Student may required strong knowledge on designing solution for complex routing problems in computer networking and performance analysis which enables them research in routing protocols and social benefits
CO3	PO1, PO2 PO10, PO12	Moderate (Medium)	Student required knowledge on connection-oriented and connection-less protocols and presentation skills for designing solution for wired and wireless communication in computer networking
	PO3, PO11	Slight (Low)	Student may required strong knowledge on complex connection-oriented and connection-less protocols in computer networking and performance analysis which enables them research in wired and wireless communication and social benefits
CO4	PO3, PO8 PO11	Slight (Low)	Designing and implementing security algorithms in computer network security will be complex process to improve safety measures for social benefits. Adopting ethical principles in multidisciplinary environments is tough task
	PO1,PO2 PO4 ,PO10 PO12	Moderate (Medium)	The students required strong mathematical and computer science and engineering knowledge to solve complex problems related to attacks in communication networks. The student will have more opportunities for professional career and research for life-long learning in context of technological change
CO5	PO1, PO2 PO4 ,PO10 Po12	Moderately	The students required strong mathematical and computer science and engineering knowledge to solve complex problems related to analyze and avoidance of congestion in communication networks. The student will have more opportunities for professional career and research for life-long learning in context of technological change
	PO3 ,PO11	Slightly	Basis for students to design and implementation of avoidance of congestion in computer networkfor improving QoS for social benefits.
CO6	PO1 , PO5	Moderately	The students are able to analyze and evaluate networking protocols through simulator using NS3 Tool
	PO2 PO10, PO12	Slightly	The students are analyze the different networking protocols through simulator using NS3 Tool

	PSO	Level	Justification
CO1	PSO2 PSO3	Slightly	The students with programming skills can able implement programs for error detection in less scalable networks and they will have opportunities to work in software industry
	PSO1	Moderately	The students are able to Demonstrate error detection technique using CRC with fundamental knowledge of computer networks
CO2	PSO2 PSO3	Slightly	The students are able to Analyze and compare routing protocol in simple networks and pursue higher studies

	PSO1	Moderately	The students with foundation knowledge of computer networking and mathematics able to Analyze and compare different routing protocols
CO3	PSO2 PSO3	Slightly	The students are able to analyse connection-oriented and connection-less protocols in the network using modern tools
	PSO1	Moderately	The students with foundation knowledge of computer networking and mathematics able to Implement the connection-oriented and connection-less protocols in the network
CO4	PSO2 PSO3 PSO4	Slightly	The students with programming skills can able implement programs for security simple network attacks
	PSO1	Moderately	The students with foundation knowledge of computer networking and mathematics able to demonstrate security features in networks using security algorithm
CO5	PSO1 PSO2 PSO3 PSO4	Slightly	The students with computer networking skills can able implement programs for Analyze congestion avoidance in the network
CO6	PSO1 PSO2	Slightly	The students with computer programming and networking skills can able to analyze networking protocols using NS3 Tool

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CSL58-DBMS WITH MINI PROJECT LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Demonstrate DDL commands on Database.	1	-	1	-	-	-	-	-	-	-	-	-	1	-	1	
CO2	Create ER diagrams and conceptual schema for the problems given.	2	1	2	1	-	-	-	-	-	-	1	-	2	2	2	
CO3	Apply Integrity constraints on relations.	2	2	2	1	-	-	-	-	-	-	1	-	2	2	2	
CO4	Demonstrate Update operations.	1	-	1	-	-	-	-	-		-	-	1	1	-	1	
CO5	Demonstrate more complex SQL queries.	1	1	1	-	-	-	-	-	-	-	-	1	2	1	2	
CO6	Implement, analyze and evaluate the project developed for an application..	-	2	2	1	-	1	1	-	1	-	2	-	1	-	1	

CO1	PO	Level	Justification
	PO1, PO3	Slightly	Fundamental knowledge of engineering are used by students to demonstrate DDL commands to design database.
CO2	PO2, PO4 PO11	Slightly	Students are able to identify entities and attributes to create ER diagrams and conceptual schema for the problems given in syllabus.

	PO1 ,PO3	Moderately	Students are able to create ER diagrams and conceptual schema for the problems given by applying Fundamental knowledge of engineering.
CO3	PO1, PO2 ,PO3	Moderately	Students can apply Integrity constraints on relations using Fundamental knowledge for Problem analysis and design
	PO4, PO11	Slightly	Students can **Conduct investigations for** analysis and interpretation of data and indicate these in report.
CO4	PO1 ,PO3 PO12	Slightly	Students can Demonstrate Update operations using fundamental knowledge for development of database in the context of technological change.
CO5	PO1 ,PO2 PO3, PO12	Slightly	Demonstrate more complex SQL queries using Fundamental knowledge of engineering and mathematics for problem analysis and development of database in the context of technological change.
CO6	PO2, PO3 PO11	Moderately	Students can implement, analyze and evaluate the project developed for an application using first principles of mathematics, sciences, and engineering.
	PO4 ,PO6 PO7, PO9	Slightly	Projects can address areas like societal, health, safety, legal and cultural issues as individual or team.

CO1	**PSO**	**Level**	**Justification**
	PSO1 PSO3	Slightly	Graduates of the Program will have solid foundation in Demonstration of DDL commands
CO2	PSO1, PSO2, PSO3	Moderately	The graduates of the Program will have solid foundation in creation of ER diagrams and conceptual schema
CO3	PSO1 PSO2 PSO3	Moderately	The graduates of the Program will have solid foundation in applying Integrity constraints on relations and are prepared for their careers in the software industry
CO4	PSO1 PSO3	Slightly	The graduates of the Program will have solid foundation for Demonstration of update operations and continue to develop their knowledge. .
CO5	PSO1 PSO3	Moderately	The graduates of the Program will have solid foundation to Analyze and apply normalization for better database design in the software industry
	PSO2	Slightly	The graduates of the Program will have skills to Demonstrate more complex queries using modern tools.
CO6	PSO1 PSO3	Slightly	Graduates of the Program will have solid foundation to Implement, analyze and evaluate the project developed for an application..

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS61- SYSTEM SOFTWARE AND COMPILERS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Interpret the concepts of assemblers and Loaders	3	2	2	2	2	3	1	2	1	1	2	3	2	2	2	2
CO2	Comprehend the phases of compiler and build Lexical Analyzer	3	2	2	2	-	-	-	-	1		1	2	2	1	2	
CO3	Design and construct the parsers.	1	3	2	3	-	-	-	3	1	2	2	2	2	1	1	1
CO4	Apply lex and yacc tools for implementing Lexer and Parser	2	2	2	2	1	-	-	3	2	1	1	2	2	2	1	1
CO5	Construct Syntax Directed Translation and generate intermediate code.	-	1	-	3	-	-	1	3	-	-	-	3	-	-	2	1
CO6	Generate ASM code for a given intermediate code	2	2	2	2	1	1	1	3	1	-	-	-	-	-	-	-

CO1	**PO**	**Level**	**Justification**
	PO1 PO6 PO12	Maps Substantially	Knowledge of engineering fundamentals are applied to the solution of the problems. The concept can be extended to current trends products to help the privileged people and can be developed using the fundamentals(chatbox).
	PO2 PO3 PO4 PO5 PO8 PO11	Maps moderately	Students can apply the knowledge identifying, formulating, designing solutions to the complex problems moderately. Also students can develop a project by using appropriate techniques discussed.
	PO7 PO9 PO10	Maps slightly	Students can communicate effectively in diverse teams for sustainable development of software systems.
CO2	PO1	Maps Substantially	The lex knowledge will help the students in their problem analysis as well as their higher studies.
	PO2 PO3 PO4 PO12	Maps moderately	The lex knowledge may slightly help the students in their problem analysis, design and development of solutions as well as the tools available for the lexers are moderately needed.
	PO9 PO11	Maps slightly	Knowledge of compilers help the students to do a project individually or as a team
CO3	PO2 PO4 PO8	Maps Substantially	Good Engineering Knowledge, Identification of the problem, Designing the solutions, Preferring the modern tool usage is strongly recommended for the parsing techniques.
	PO3 PO10 PO11 PO12	Maps moderately	Helps the students in building new parser for their new project
	PO1 PO9	Maps slightly	Various parsing techniques may help the students slightly in their multidisciplinary environment as well as their higher studies.
CO4	PO8	Maps Substantially	Helps the student to practice professional ethics substantially
	PO1 PO2 PO3 PO4 PO9 PO12	Maps moderately	Basic knowledge of lex and YACC provides the student to analyze , Design and develop the solution to complex problems. as a team and communicate seamlessly among the team members moderately
	PO5 PO10 PO11	Maps slightly	Implementing a project using modern tool maps slightly.

CO5	PO4 PO8 PO12	Maps Substantially	Importance of translation is known here.
	PO2 PO7	Maps slightly	Helps the students to solve the real world problems
CO6	PO8	Maps Substantially	
	PO1 PO2 PO3 PO4	Maps moderately	To implement the code generator, the students should have a strong fundamental knowledge.
	PO5 PO6 PO7 PO9	Maps slightly	Helps the students to solve the real world problems



RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS62-COMPUTER GRAPHICS & VISUALIZATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Discuss and demonstrate Computer Graphics applications, primitives and attributes using OpenGL.	2	1	2	1	2							1	2	2	2	
CO2	Illustrate geometric transformations and viewing on 2D objects.	2	2	2	1	3				1			2	2	2	2	
CO3	Examine concepts of clipping and geometric transformation on 3D objects.	2	3	3	2	3							2	2	2	2	

CO4	Infer properties of light and develop Illumination models.		1	1	1	3			1	1			1		2	3	
CO5	Analyze 3D Viewing and Visible Surface Detection			2	1	2				1			2	1		3	
CO6	Explore different representation of Programming event driven input and concepts of curved surfaces.	2	3	2	3	2				1			2	2		2	

CO1	**PO**	**Level**	**Justification**
	PO1 PO3 PO5	Maps moderately	Representation of primitives and attributes requires engineering knowledge and design. Programs can be designed using OpenGL package.
	PO2 PO4 PO12	Maps slightly	2D graphics requires the knowledge of problem analysis,
CO2	PO 1 PO 2 PO3 PO12	Maps moderately	Geometric transformation has mathematical calculations
	PO4 PO9	Maps slightly	Simple applications can be designed
	PO5	Maps Substantially	2D and 3D representation requires openGL package
CO3	PO1 PO4 PO12	Maps moderately	Initial geometrical concepts are required
	PO2 PO3 PO5	Maps Substantially	Different algorithms of clipping are analyzed
CO4	PO 2 PO 3 PO 4 PO 8 PO9 PO12	Maps slightly	Knowledge of software and hardware are used for development
	PO5	Maps moderately	Related packages for development
CO5	PO3 PO5 PO12	maps moderately	Different event level programming requires appropriate call back function
	PO4 PO9	Maps slightly	Different call back can be used for an application
CO6	PO9	Maps slightly	Can be used for developing simple projects

	PO1 PO3 PO5 PO12	maps moderately	Basic knowledge and representation of lines and points
	PO 2 PO 4	Maps Substantially	Requires understanding of formulas

CO1	**PSO**	**Level**	**Justification**
	PSO1 PSO2 PSO3	Maps moderately	Knowledge of Graphics is required
CO2	PSO1 PSO2 PSO3	Maps moderately	Geometric transformation requires the understanding of
CO3	PSO1 PSO2 PSO3	Maps moderately	Various Clipping and visible detection are applied
CO4	PSO2	Maps moderately	Hardware and software configuration
	PSO3	Maps substantially	
CO5	PSO1	Maps slightly	event driven program will help for further programming in other areas of computer science
	PSO3	Maps substantially	Software industry requires the usage of callback function
CO6	PSO1 PSO3	Maps moderately	Mathematical representation will help to improve the basic knowledge of computer science and can be used for developing and designing other applications.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS63- Web Technology and its Applications

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Realize HTML and CSS syntax and semantics to build web pages.	2	-	2	-	2	-	-	-	1	-	1	2	2	2	3	-
CO2	Construct and visually format tables and forms using HTML and CSS	2	-	2	-	2	-	-	-	1	-	1	2	2	2	2	-
CO3	Develop Client-Side Scripting and server side scripting using JavaScript and PHP	2	2	3	1	3	-	-	-	2	1	2	3	3	3	3	-
CO4	Appraise the principles of object oriented development using PHP	2	1	2	1	3	-	-	-	2	1	2	3	3	3	3	-
CO5	Examine state management features and optimizing web applications	2	1	3	1	3	-	-	-	2	2	2	3	3	2	3	2
CO6	Articulate the role of XML/JSON and Web Servicesin javascript and PHP	2	1	3	1	3	-	-	-	3	2	2	3	3	3	3	-

CO1	**PO**	**Level**	**Justification**
	PO1 PO3 PO5	maps moderately	The basic knowledge of computer science will help the students to understand Structure , Semantic of markup languages
	PO9 PO11	Maps slightly	The basic knowledge of markup languages will help the students to build own web page.
CO2	PO1 PO3 PO5 PO1 2	Maps moderately	The basic knowledge of computer science will help the students to understand usage of Cascading Style Sheets
	PO9 PO11	Maps slightly	The knowledge of Cascading Style Sheets helps the students create their own web page.
CO3	PO1 PO5 PO9 PO11	Maps moderately	The basic knowledge of computer science will help the students to understand concept of different scripting languages which helps to validate information.
	PO3 PO5 PO12	Maps Strongly	Understand Java Scripts to verify and validate form inputs Interaction with client browsers
	PO4 PO10	Maps slightly	Interaction with real world-to collect data
CO4	PO1 PO3 PO9 PO11	Maps moderately	Interaction with server side technologies like PHP supports data processing and storage Dynamic Response generation
	PO2 PO4 PO10	Maps slightly	Interaction & Data Collection from clients and processing at server side.
	PO5 PO12	Maps Strongly	Develop dynamic client - server applications
CO5	PO3 PO5 P012	Maps Highly	The knowledge of server side S c r i p t i n g language will help the students to understand client server application which will enhance the students to design different web pages.
	PO1 PO9 PO10 PO11	maps moderately	The knowledge of computer science will help the students to understand client/server design.
	PO2 PO4	Maps slightly	The knowledge so gained will form the basis for interpreting the client server design concepts.

CO6	PO3 PO5 PO9 PO12	Maps Highly	The knowledge of jQuery and Backbone frameworks will help the students to design and develop web sites.

	PO1 PO10 PO11	Maps moderately	The knowledge of computer science will help the students to understand fundamentals of framework.
	PO2 PO4	Maps slightly	The basic knowledge of will enable the students to analyze different frameworks.
CO1	**PSO**	**Level**	**Justification**
	PSO1	maps moderately	The basic knowledge of computer science and its fundamentals will help the students to understand Structure , Semantic of markup languages will lay down solid foundation for Engineering
	PSO3	Maps slightly	The basic knowledge of markup languages will help the students to help them to build web pages in future.
CO2	PSO 1 PSO 2 PSO 3	Maps slightly	The basic knowledge of computer science will help the students to understand usage of Cascading Style Sheets which will help to build the Carrier in software industry.
CO3	PSO1 PSO2 PSO3	Maps moderately	The basic knowledge of computer science will help the students to understand concept of different scripting languages which helps to design and validate information in industrial applications
CO4	PSO3	Maps moderately	The knowledge of Document object model (DOM) will help the students to design dynamic web pages which will be useful in software industry..
	PSO1 PSO2	Maps slightly	The knowledge of Regular Expression will help the Students analyze information dynamically which will help the students to learn computer fundamentals.
CO5	PSO3	Maps Highly	The knowledge of Scripting languages will help the students to understand client server application which will enhance the students to design their own web pages.
	PSO 1 PSO 2 PSO 4	maps moderately	The knowledge of computer science will help the students to understand client/server design which will ensure the authenticate and confidentiality.
CO6	PSO2 PSO3	maps moderately	The knowledge of computer science will help the students to understand fundamentals of framework which will be used for the benefits of society.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS641-DATA MINING AND DATA WAREHOUSING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Perceive data warehousing concepts and representation of multidimensional data models with their operations	2	2	-	-	3	-	-	-	-	-	-	2	-	2	2	-
CO2	Comprehend implementation of data warehouse	-	-	-	-	-	-	-	-	-	-	-	2	2	2	-	-
CO3	Assort data mining tasks and understand data proximity measures.	1	1	-	1	-	-	-	-	-	-	-	2	1	-	-	-
CO4	Interpret the association patterns among data and appraise association algorithms	1	2	1	2	1	2	-	-	-	-	-	2	1	2	2	-
CO5	Estimate various classification techniques	-	2	1	-	3	2	-	-	2	1	-	2	-	2	2	--

CO6	Understand and apply clustering techniques in various applications.	-	2	1	2	3	2	-	-	2	1	-	2				-

	PO	Level	Justification
CO1	PO1 PO2 PO12	Maps moderately	The knowledge of Data Models helps students to identify real world requirements and represent data in multiple dimensions and support for effective data visualization.
	PO5	Maps Strongly	The knowledge of Data Modeling helps to understand different multidimensional views like rotate, slice-horizontal/vertical
CO2	PO12	maps moderately	The basic knowledge of computer science will help the students to understand Data Mining Applications and need the Data Warehouse and its applications
CO3	PO1 PO2 PO4	Maps Slightly	The understanding of Data Preprocessing operations helps students to analyze different types of data available in the real world
	PO12	Maps Moderately	The knowledge of data preprocessing techniques help students to build the efficient data mining models
CO4	PO2 PO4 PO6 PO12	Maps moderately	The knowledge of Association Rule mining helps students to analysis market basket data and find useful associations such that it enhances the decision-making in business organizations
	PO1 PO3 PO5	Maps slightly	Explore different Association Rule mining evaluation techniques and applications such that it used to compare and develop efficient models.

CO5	PO2 PO6 PO9 PO12	Maps moderately	It helps to understand different application of classifier algorithms
	PO5	Maps strongly	The evaluation of classification models using outcomes of Confusion Matrix
	PO3 PO10	Maps slightly	Helps to understand domain specific applications of classifier models like disease classification, document classification etc.
CO6	PO2 PO4 PO6 PO9 PO12	Maps Moderately	The basics of Data Clustering helps to analyze real world data and identification of domain specific clusters
	PO3 PO10	Maps Slightly	The understanding of clustering algorithms helps to students to understand the patterns exhibited by real world data
	PO5	Maps Strongly	Analyze various cluster models and gain the knowledge different similarity and dissimilarity measures

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS643- CLOUD COMPUTING AND ITS APPLICATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Understand the concept of cloud computing, virtualization and classify services of cloud computing	3	3	2			3							3	3		
CO2	Illustrate architecture and programming in cloud		3		2												
CO3	Define the platforms for development of cloud applications and list the application of cloud	2		2								2			1		
CO4	Develop Server-Side Scripts using PHP Analyze various cloud programming models and apply them to solve problems on the cloud	2	2	3									2	2			
CO5	Comprehend the core issues of cloud computing such as security, privacy, and interoperability						3	1									
CO6	Explore the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc.		2	2								2			2	1	1

CO1	PO	Level	Justification
	PO 1 PO 2	maps Strongly	The basic knowledge of computer science will help the students Understand the concept of cloud computing, virtualization and classify services of cloud computing, types of cloud computing

	PO 6		
	PO9 PO11	Maps slightly	The basic knowledge of virtualization and classify services of cloud computing will help the students to build their own cloud.
CO2	PO2	Maps Strongly	The basic knowledge of computer science will help the students to understand and Illustrate architecture and programming in cloud
	PO4	Maps moderately	The knowledge of map reducing techniques in cloud helps the students to programming in cloud .

CO3	PO1 PO3 PO11	Maps moderately	The basic knowledge of computer science will help the students to Define the platforms for development of cloud applications and list the application of cloud
CO4	PO1 PO2 PO1 2	Maps moderately	Develop Server-Side Scripts using PHP
	PO3	Maps Strongly	Analyze various cloud programming models and apply them to solve problems
CO5	PO6	Maps Strongly	Understand the core issues of cloud computing such as security, privacy, and interoperability
	PO7	maps slightly	Understand the core issues of cloud computing such as security, privacy, and interoperability.
CO6	PO2 PO3 PO11	Maps moderately	Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid

CO1	**PSO**	**Level**	**Justification**
	PSO1	maps strongly	The basic knowledge of computer science and its fundamentals will help the students to understand Understand the concept of cloud computing, virtualization and classify services of cloud computing
	PSO2	Maps strongly	The basic knowledge of virtualization and classify services of cloud computing will help the students to build their own cloud in future.
CO3	PSO2	Maps moderately	The basic knowledge of computer science will help the students to Define the platforms for development of cloud applications and list the application of cloud
CO4	PSO1	Maps moderately	Analyze various cloud programming models and apply them to solve problems
CO6	PSO2 PSO3	maps moderately	Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid
	PSO4	Maps slightly	Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CSL66-SS LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Demonstrate the working of Lexer.	3	1	3	2	3	-	-	-	-	-	-	1	-	-	1	-
CO2	Implement various parsing techniques.	3	3	3	2	3	-	-	-	-	-	1	1	2	1	2	-
CO3	Implement a code generator	3	3	3	2	1	-	-	-	-	-	1	1	3	1	3	-
CO4	Implement and analyze various CPU scheduling algorithms.	3	2	3	2	1	-	-	-	-	-	-	1	2	1	1	-
CO5	Implement resource allocation and deadlock avoidance algorithm.	3	2	3	2	1	-	-	-	-	-	-	1	1	1	1	-
CO6	Evaluate different algorithms required for management of page allocation techniques.	3	2	3	2	1	-	-	-	-	-	-	1	1	1	2	-

CO1	PO	Level	Justification
	PO 1 PO 3 PO 5	Maps Strongly	The knowledge of mathematical principles and basics, design and development of solutions as well as the tools available for the Lexers are strongly needed
	PO4	Maps moderately	The investigation of the given Lex problem is needed moderately
	PO2 PO12	Maps slightly	The Lex knowledge may slightly help the students in their problem analysis as well as their higher studies
CO2	PO1 PO2 PO3 PO5	Maps Strongly	Good Engineering knowledge, identification of the problem, designing the solutions, preferring the modern tool usage is strongly recommended for the parsing technique
	PO4	Maps moderately	The student need to conduct an moderate investigation while designing various parsing technique
	PO11 PO12	Maps slightly	Various parsing techniques may help the students slightly in their multidisciplinary environment as well as their higher studies
CO3	PO1 PO2 PO3	Maps Strongly	To implement the code generator the student should have a strong fundamental knowledge, problem analysis and development of solutions
	PO4	Maps moderately	The code generator needs an moderate investigation of complex problems
	PO5 PO11 PO12	Maps slightly	Code generators require a slight knowledge of modern tools, may help slightly in their working with a multidisciplinary team as well as in their preparation for long term learning
CO4	PO1 PO3	Maps Strongly	The knowledge of mathematical principles and basics of computer science will help the students to apply and exploit parallel processing and analyse the processor performance.
	PO2 PO4	Maps moderately	Designing Parallel Processing Techniques requires strong analysis skills and longevity of learning.
	PO5 PO12	Maps slightly	Development and performance analysis of various Process Scheduling algorithms requires longevity of learning.
CO5	PO1, PO3	Maps Strongly	The knowledge of mathematical principles and basics of computer science will help the students to build concurrency in application.
	PO2 PO4	Maps moderately	Dead lock management needs analysis and research methodologies to solve complex issues of real world.
	PO5 PO12	Maps slightly	Dead lock Management Skills should be adapted with the new changing environment and requires lifelong learning.
CO6	PO1, PO3	Maps Strongly	The knowledge of mathematical principles and basics of computer science will help the students to design and build various resource management techniques.

	PO2 PO4	Maps moderately	Determine the best memory management technique for different operating systems needs analysis of complex problem solving skills.
	PO5 PO12	Maps slightly	Resource Management Skills should be adapted with the new changing environment and requires lifelong learning.

CO1	**PSO**	**Level**	**Justification**
	PSO3	Maps slightly	The Lex knowledge may slightly help the students in their problem analysis as well as their higher studies
CO2	PSO1 PSO3	Maps moderately	Good Engineering knowledge, identification of the problem, designing the solutions, preferring the modern tool usage is strongly recommended for the parsing technique as well as their higher studies
	PSO2	Maps slightly	Various parsing techniques may help the students slightly in their multidisciplinary environment
CO3	PSO1 PSO3	Maps Strongly	To implement the code generator the student should have a strong fundamental knowledge, problem analysis and development of solutions
	PS02	Maps moderately	Code generators require a slight knowledge of modern tools, may help slightly in their working with a multidisciplinary team as well as in their preparation for long term learning
CO4	PSO1	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply and exploit parallel processing and analyse the processor performance and longevity of learning.
	PSO2 PSO3	Maps slightly	Development of any new application in multidisciplinary environment requires fundamental knowledge of functionalities of OS
CO5	PSO1 PSO2 PSO3	Maps slightly	The knowledge of mathematical principles and basics of computer science will help the students to build concurrency in different application platforms and should be adapted with the new changing environment for sustainability.
CO6	PSO1 PSO2	Maps slightly	The knowledge of mathematical principles and basics of computer science will help the students to design and build various resource management techniques.
	PSO3	Maps moderately	Determine the best memory management technique for different operating systems needs analysis of complex problem solving skills and requires lifelong learning.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CSL67-CG&V Lab WITH MINI PROJECT

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Implement Geometric primitives using OpenGL.	2	1	2	-	2	-	-	-	-	-	-	2	2	1	1	-
CO2	Apply 2D and 3D geometric transformations on objects.	2	2	3	2	2	-	-	-	-	-	-	2	2	2	1	-
CO3	Demonstrate viewing in real world scenarios using OpenGL	2	2	3	2	2	1	1	-	3	3	2	2	2	2	2	-
CO4	Visualization of clipping algorithms.	2	3	2	1	2	-	-	-	-	-	-	2	2	2	1	-
CO5	Apply different Programming event driven input	2	2	2	1	2	-	-	-	-	-	-	2	3	2	1	-
CO6	Transform 2D and 3D geometric objects.	3	3	2	1	2	-	-	-	2	-	-	2	2	2	1	

CO1	**PO**	**Level**	**Justification**
	PO 1 PO 3 PO 5 PO12	Maps moderately	The knowledge of mathematics will help to draw graphics primitives (line, rectangle, circle etc). and write simple graphics programs. Basic knowledge can be used for life long learning
	PO2	Maps slightly	Basic mathematical equations (eg equation of line,circle,ellipse) are required to understands graphics.
CO2	PO3	Maps Substantially	The knowledge of Opengl will help students to design and develop programs using builtin primitives.
	PO 1 PO 2 PO 4 PO5 PO12	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to independently write opengl programs.
CO3	PO6 PO7	Maps Slightly	Students will be able to code for pictorial representation of environmental canditions.
	PO1 PO2 PO4 PO5 PO11 PO12	Maps moderately	Students will be able to create 2D and 3D objects.
	PO3 P09 P10	Maps Substantially	Students can develop mini-projects using opengl concepts and write the report for their project and also present their projects, which will help them to improve communication skills.
CO4	PO4	Maps slightly	The knowledge of mathematical principles and basics of computer graphics will help students to investigate on different drawing methodology.
	PO1 PO3 PO5 PO12	Maps moderately	Using modern tools and framework (Visual Studio) students will be able draw 2D objects.
	PO2	Maps Substantially	Using different algorithms students will be able to analyse how pixels are plotted to draw objects on display window.
CO5	PO 1 PO 2 PO 3 PO5 PO12	maps moderately	The knowledge of mathematical principles and different clipping algorithms will help students to understand different clipping techniques (Point clipping, line clipping, text clipping, curve clipping)

	PO4	Maps slightly	Students can analyze how clipping is applied for any type of figures, text. and curve
CO6	PO1 PO2	Maps Substantially	Using the basics of mathematics will help us to apply geometric transformations like translation, rotation, scaling, shear, reflection.
	PO3 PO5 PO9 PO12	maps moderately	Using geometric transformations students will be able to design any 2d and 3d objects and create animated projects (such as games, sceneries)
	PO4	Maps slightly	Students will be able to analyze and find different methodology

18CSMP68-MOBILE APPLICATION DEVELOPMENT

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	P	PSO2	PSO3	PSO4
CO1	Interpret the structure of Programming in Android Environment.	2	1	3	1	3	2	2	-	2	-	1	1	2	-	3	-
CO2	Configure Android studio to run the applications.	2	-	2	-	3	-	-	-	2	-	1	1	2	-	2	-
CO3	Implement Android's User interface functions.	3	3	3	1	3	2	2	-	2	-	1	1	3	1	2	-

CO4	Demonstrate database operations in SQLite.	3	3	3	2	3	1	1	-	2	-	1	2	3	2	3	-
CO5	Inspect different methods of sharing data using services.	3	2	2	2	3	1	1	-	3	-	1	2	3	1	2	-
CO6	Design and develop applications in Android Environment.	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3

CO1	**PO**	**Level**	**Justification**
	PO2	1	Maps slightly as the students require to acquire the art of programming to develop the ability to design and simulate the real world objects into Android Environment at a later stage
	PO4	1	Maps slightly as the students require to develop analyze and design to develop complex designs at a later stage and to run the applications in an effective manner
	PO11	1	Maps slightly as the student is using the developed tools and requires to develop the skills and techniques, work as a member in android environment
	PO12	1	Maps slightly as there is consistent the need for and an ability to engage in, to resolve contemporary issues and acquire lifelong learning as the application is constantly evolving in nature

	PO1	2	Maps moderately as the student is required to understand the fundamental mathematical concepts like logical reasoning) science and engineering for solving Engineering problems and modeling further
	PO6	2	Maps moderately as the developer needs to be professional and has to take care of legal, cultural and social responsibilities before developing the application and presenting to the user
	PO7	2	Maps moderately as the student is required to develop the art of programming which leads towards the broader education which is necessary to understand the impact of engineering solutions in a global, economic, environmental and demonstrate the knowledge need for sustainable development
	PO9	2	Maps moderately the student is required to develop an ability to function on multi-disciplinary teams on some project requirements
	PO3	3	Maps strongly as the students is required to have a thorough in-depth programming skills so that he can develop a complex application based on the desired specifications and needs
	PO5	3	Maps strongly as the student is required to have a thorough programming ability which would further beneficial to use the techniques, skills and modern engineering tools necessary for engineering practice

CO2	PO11	1	Maps slightly as the student is required to have basic configuring knowledge and know how to use the modern engineering tools, techniques, skills as an individual
	PO12	1	Maps slightly as the student needs to have basic configuring knowledge which would develop within them an ability to engage in, to resolve contemporary issues and acquire lifelong learning
	PO1	2	Maps moderately as the student is required to have basic knowledge of mathematics, science, and engineering for solving Engineering problems and modeling

	PO3	2	Maps moderately as the student needs to understand the system or process to meet desired specifications and run the applications
	PO9	2	Maps moderately as the configuring and running of the applications vary in multi-disciplinary environment
	PO5	2	Maps moderately as the configuring Android studio to run the applications are fundamentals which are necessary to use the techniques, skills and modern engineering tools necessary for engineering practice
CO3	PO4	1	Maps slightly as the student is required to understand the basic fundamental ability to identify, formulate, comprehend, analyze design synthesis of the information to solve and implement complex engineering problems
	PO11	1	Maps slightly as the student requires to have an ability to understand the use the modern engineering tools, techniques and skills to implement the android user interface functions
	PO12	1	Maps slightly as a proper understating of the Android user interface functions A recognition of the need for, and an ability to engage in, to resolve contemporary issues and acquire lifelong learning
	PO6	2	An understanding of professional, health, safety, legal, cultural and social responsibilities
	PO7	2	Maps moderately as the student as a developer needs to be aware of the impact of engineering solutions in a global, economic, and environmental and demonstrate the knowledge need for sustainable development.
	PO9	2	Maps moderately as the student is required to have the knowledge and the ability to function on multi-disciplinary teams.
	PO1	3	Maps strongly as the student has to develop An ability to apply knowledge of mathematics for solving Engineering problems and modeling to implement Android's User interface functions

	PO2	3	Maps strongly as the student needs to acquire the innate ability to understand and develop an ability to design, simulate and conduct experiments, as well as to analyze and interpret data including hardware and software components which he would be able to implement further
	PO3	3	Maps strongly as the user has to understand and implement complex applications to meetthe desired specifications and needs
	PO5	3	Maps strongly as the student is required to develop an ability to use the techniques, skills and modern engineering tools which would lead towards implementation and necessary for engineering practice
CO4	PO6	1	Maps slightly as a proper understanding and professionalism should be adopted while creating ,modifying and querying on the SQLite database specified above
	PO7	1	Maps slightly as proper creation of the database is necessary for a sustainable development in future
	PO11	1	Maps slightly as we have to have a skilfulapproach while creating the databases with optimized querying techniques so that the performance of the responsiveness of the dataset is improved
	PO4	2	Maps moderately as there is a need and necessity to identify and comprehend the information which is stored in the databases to solve complex engineering problems and provide valid conclusions
	PO9	2	Maps moderately as the database so created should have the capability to function on multi-disciplinary teams with ease and convenience
	PO12	2	Maps moderately as the creation of the databases is not static and will be evolving over the years based on the emerging requirements and the querying also becomes complex due to the evolving databases there is life learning required

	PO1	3	Maps strongly as the creation modification and querying involves strong logical reasoning ability and further the deep knowledge of mathematics is required in the query optimization techniques to achieve r better performance and efficiency
	PO2	3	Maps strongly as the ability to analyze and interpret data including hardware and software components to assess the capabilities of the software to hold the data
	PO3	3	An ability to design a complex electronic system or process to meet desired specifications and needs
	PO5	3	Maps strongly as the student is required to develop the ability to use the techniques, skills and modern engineering tools necessary for engineering practice
CO5	PO6	1	Maps slightly as proper understanding of the different methods of sharing data and services is essential
	PO7	1	Maps slightly as it is necessary impact of sharing data using in an integrated manner and know the impact of engineering solutions for sustainable development
	PO11	1	Maps slightly as it is necessary to understand and adopt latest technologies using modern tools and techniques for data transfer and providing services accordingly
	PO2	2	Maps moderately as the student is required is a necessity to develop to analyze, interpret data including hardware and software components to provide effective data sharing services
	PO3	2	Maps slightly as it is necessary for us toknow system or process to meet desired specifications and needs to provide quick data sharing and services
	PO4	2	Maps moderately as the student is required to develop an ability to identify, formulate, comprehend, analyze the information to solve complex engineering problems and provide valid conclusions

	PO12	2	As the amount of data is increasing exponentially day by day there is a need for us to engage in, to resolve contemporary issues and acquire lifelong learning to provide effective and efficient data sharing and services
	PO1	3	Maps strongly as the creative thinking and mathematical reasoning is required to logically analyze different methods of sharing data and provide appropriate services
	PO5	3	Maps substantially as it is necessary and there is a need to develop an ability to use the techniques, skills and modern engineering tools necessary for engineering practice
	PO9	3	As each one of them has different methods of data storage and sharing of data takes place from different sources, it is essential to develop an ability to function on multi-disciplinary teams.
CO6	**PO**	**Level**	**Justification**
	PO7	1	Maps slightly as it to understand the design and implementation aspects of applications in an android environment to demonstrate the knowledge need for sustainable development.
	PO1	3	Maps strongly as the application of knowledge of mathematics is required to develop models which are useful for implementation in real time applications to solving Engineering problems
	PO2	3	Maps strongly as the ultimate goal is to design and develop applications usinghardware and software components
	PO3	3	Maps strongly as it is necessary to develop an ability to design a complex android application to meet specifications and needs
	PO4	3	Maps strong as the student has to develop an ability to identify, formulate, comprehend, analyze, design and implement application s to solve complex engineering problems and provide valid solutions
	PO5	3	Maps strongly as we have to constantly upgrade ourselves and develop an ability an ability to use the techniques, skills and modern engineering tools necessary for engineering practice

	PO6	3	Maps strongly as a proper professional approach safety of the applications being developed with legal, cultural and social responsibilities is required to be incorporated while designing and implementing applications
	PO8	3	Apply ethical principles, responsibility and norms of the engineering practice
	PO9	3	Maps strongly as the design and implementation requirements of Android Development An ability to function on multi-disciplinary teams.
	PO10	3	Maps strongly as It is very essential to communicate and present effectively once an application is developed so that maximum benefit can be gained out of the application developed
	PO11	3	Maps strongly as the student is required to develop an ability to use the modern engineering tools, techniques, skills and management principles to do work as a member and leader in a team, to manage projects in multi-disciplinary environments for proper design and implementation applications in Android Environment
	PO12	3	A recognition of the need for, and an ability to engage in, to resolve contemporary issues and acquire lifelong learning

CO	PSO	Level	Justification
CO1	PSO1	2	Maps moderately as the students are required to learn and acquire the art of Programming in Android Environment
	PSO3	3	Maps strongly as the ability to learn and acquire the art of Programming in Android Environment are vital to handle and run android applications
CO2	PSO1	2	Maps moderately as the knowledge of Configuring Android studio is essential to run the applications
	PSO3	2	Maps moderately as configuring and running the applications are essential part of the android programming

CO3	PSO1	3	Maps strongly as the understanding and implementation of Android's User interface functions are essential to run the Android Applications
	PSO2	1	Maps moderately as the understanding and implementation of Android's User interface functions form the basis to run Android Applications
CO4	PSO1	3	Maps Moderately as knowledge of creation, modification and querying using SQLite database and their operations are crucial for connectivity in some applications
	PSO2	2	Maps Moderately as the knowledge of creation, modification and querying using SQLite database and their operations are essential in solving some of the Engineering problems
CO5	PSO1	3	Maps strongly as the understanding of different methods of sharing data using services will give completeness
	PSO2	1	Maps slightly as the understanding of different methods of sharing data using services is necessary to give good performance
	PSO3	2	Maps moderately as it is necessary to Inspect different methods of sharing data using services
CO6	PSO1	3	Maps strongly as the knowledge of mathematics and engineering fundamentals are extensively used in designing and implementation of for developing creative applications in Android Environment
	PSO2	3	Maps strongly as choosing appropriate Design and implementation methods to develop application needs the exposure to modern tool usage
	PSO3	3	Maps strongly as the designing and implementing applications in Android Environment is the ultimate goal of Android Development to run the desired applications
	PSO4	3	Maps strongly as the Ethics and integrity in designing and implementation must be inculcated in engineering practice

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS71-ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS72- Big Data Analytics

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Master the concepts of HDFS and MapReduce framework	2	1	1	2	1							1	1	1	1	
CO2	Investigate Hadoop related tools for Big Data Analytics and perform basic Hadoop Administration	1	2	2	2	1							1	1	1	2	
CO3	Recognize the role of Business Intelligence, Data warehousing and Visualization in decision making	1	1	1	1	1							1	1	1	2	
CO4	Infer the importance of core data mining techniques for data analytics	1	2	1	2	1							1	1	2	1	
CO5	Compare and Analyze different contrast different Text Mining Techniques	1	1	1	2	1							1	1	2	1	
CO6	Explore the applications of Social Networking and Web mining Techniques	1	2	2	2	1							1	1	1	1	

	PO	Level	Justification
CO1	PO1 PO4	maps moderately	The basic knowledge of computer science will help the students to understand HDFS and its applications
	PO2 PO3 PO5 PO12	Maps slightly	The basic knowledge of MapReduce Framework will help the students to understand parallel computations
CO2	PO2 PO3 PO4	Maps moderately	The knowledge of Apache Ambari operation helps to understand Hadoop administration and interaction with Hadoop tools like pig, hive and Oozie
	PO1 PO5 PO12	Maps slightly	The knowledge of Apache Scoop and Apache Flume helps to interact with Database and real data stream acquirement.
CO3	PO1 PO2 PO3 PO4 PO5 PO12	Maps Slightly	The knowledge of Business Intelligence and Data Visualization Techniques helps students to understand real word data categories and different Data Analytics Techniques
CO4	PO2 PO4	Maps moderately	Understand different Data Mining Operations and its applications in Knowledge Discovery Process
	PO1 PO3 PO5 PO12	Maps slightly	Explore different Data Preprocessing operations which are preliminary before the use of data mining techniques.
CO5	PO4	maps moderately	The knowledge of Text Data Mining will help the students to understand different categories of text data, analysis and processing.
	PO1 PO2 PO3 PO5 PO12	Maps slightly	The knowledge so gained will form the basis for interpreting different forms of text data in real world and knowledge extraction.
CO6	PO1 PO5 PO12	Maps Moderately	The basics of Data Mining helps to analyze social networks and explore specific techniques used to perform social network analysis.
	PO2 PO3 PO4	Maps Slightly	The web mining approaches helps to analyze web data and extract useful patterns from web data

To analyze the various screen based controls various concepts of web and business functions

18CS734-UID

	Course Outcomes	Program Outcomes											Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Conceptualize the various user interfaces	1											1	1		1	
CO2	Summarize various concepts of web and business functions	1	2	1	1								1	1		1	
CO3	Make an analysis of the various types of menus	1	1										1	1		1	
CO4	Interpret the various windows, characteristics of windows and device based controls	1											1	1		1	
CO5	To analyze the various screen based controls	1											1	1		1	
CO6	To apply the various testing methods	1											1	1		1	

CO	PO	Mapping level	Justification
CO1	PO1 PO12	Slightly	As the students are required to focus only on the fundamentals of interfaces
CO2	PO1 PO2 PO3 PO4 PO12	Moderately	As the students are required to interpret the various web and business functions which lays the foundation for them to build mathematical modeling ability and hence maps moderately
CO3	PO1 PO2 PO12	Slightly	As the students analyze the types of menu structures which further enhances their ability to design different types of menus
CO4	PO1 PO12	Slightly	Students can have basic knowledge of the working of the various windows,characteristics of windows and controls of windows that will be helpful to apply this gained knowledge in future and hence maps slightly
CO5	PO1 P12	Slightly	As the Students are to interpret different types of screen based
CO6	PO1 PO12	Slightly	As the Students can apply the various testing methods studied o which would be helpful in future it maps slightly

CO	PSO	Mapping level	Justification
CO1	PSO 1 PSO 3	Slightly	Graduates will use the solid foundation in the principles of computer science by understanding the concepts of menus, windows and interfaces which would be helpful to adapt these concepts during their career in software industry or while pursuing higher studies.
CO2	PSO 1 PSO 3	Slightly	Graduates will use the solid foundation in the principles of computer science to comprehend various business functions during their career in software industry or while pursuing higher studies.
CO3	PSO 1 PSO 3	Slightly	Graduates will use the solid foundation in the principles of computer science to analyze the characteristics and components of windows during their career in software industry or while pursuing higher studies.
CO4	PSO 1 PSO 3	Slightly	Graduates will use the solid foundation in the principles of computer science to develop the capability to demonstrate the various controls of windows during their career in software industry or while pursuing higher studies.
CO5	PSO 1 PSO 3	Slightly	Graduates will use the solid foundation in the principles of computer science Illustrate the concepts of business continuity and disaste recovery in a storage infrastructure during their career in software industry or while pursuing higher studies.
CO6	PSO 1 PSO	Slightly	Graduates will use the solid foundation in the principles of computer science to apply the various testing methods during their career in software industry or while pursuing higher studies.

	3		

18CS743-NATURAL LANGUAGE PROCESSING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Understand the challenges and applications of NLP.	1		2										1		1	
CO2	Illustrate semantics and pragmatics of language for NLP.	2	2	2	2								1	2			2
CO3	Analyze the natural language text at word level and semantic level.	2	3	2	2								1	2			
CO4	Establish dependency path and annotate knowledge role.	2	3	2										2			1
CO5	Demonstrate techniques and tools used in Text mining.	2	2	2	2	1							2	1	2	1	
CO6	Explore various information retrieval techniques.	2	2	2	1								2	2		1	

	PO	Level	Justification
CO1	PO1,	Maps slightly	The basics of computer science will help the students to understand the applications and challenges of NLP.

	PO3	Maps moderately	Identification of Design solutions help the students to understand the applications of NLP
CO2	PO1 PO2, PO3 PO4	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to analyse, formulateand develop a design solution to research based problem
	PO12	Maps slightly	Students explore recent trends in NLP

CO3	PO1 PO3 PO4	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to analyse theNatural Language at word level and semantic level which can be a research based problem.
	PO2	Maps substantially	Identify, formulate and analyse the natural language text at word level and semantic level.
	PO12	Maps slightly	Recent trends in Analysis of natural language text can be explored.
CO4	PO1 PO3	Maps moderately	The knowledge of mathematical principles and basics of computer science will help the students to apply the same and design solution to the dependency path and annotate knowledge role.
	PO2	Maps substantially	Analyse the dependency path and formulate the annotations knowledge role.
CO5	PO1, PO2, PO3, PO4, PO12	maps moderately	The basics of computer science will help the students to analyse, design solutions using various tools and techniquesfor the text mining.
	PO5	Maps slightly	Students explore modern programming techniques and tools.
CO6	PO1, PO2, PO3, PO12	maps moderately	The basics of computer science will help the students to analyse, design and develop solutions for various Information retrieval. Students can look into current trends in IR.
	PO4	Maps slightly	Students identify the design components of recent trends in IR.

	PSO	**Level**	**Justification**
CO1	PSO1, PSO3	Maps slightly	The solid foundation in the principles and practices of computer science will help the students to understandthe challenges and applications of NLP and develop their professional knowledge.
CO2	PSO1, PSO4	Maps moderately	Solid foundation in the principles and practices of computer science will help the students to practice theprofession with ethics.
CO3	PSO1	Maps moderately	Solid foundation in the principles and practices of computer science will help the students to analyse theNatural language text.
CO4	PSO1.	Maps moderately	Solid foundation in the principles and practices of computer science is required for the students tounderstand the relation extraction by dependency graph.
	PSO4	Maps Slightly	Relation extraction by dependency graph help the students to practice the profession with ethics.
CO5	PSO1, PSO3	Maps Slightly	Foundation of computer science is essential for the students to apply various techniques and tools used in text mining, and helps students to build their careers in the software industry
	PSO2	Maps moderately	Modern techniques and tools aid students to develop skills to function as members of multidisciplinary teamsand to communicate effectively using modern tools
CO6	PSO1	Maps moderately	Basics of computer science is required to explore various information retrieval techniques.
	PSO3	Maps Slightly	IR techniques will help the students to build their careers in the software industry

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS744-CRYPTOGRAPHY

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Apply the basics of number theory in various cryptographic techniques and summarize its applications	3	3		1								2	3	2	2	
CO2	Design and develop simple cryptography algorithms for real world situation.	3	3	3	2	2	2		1				2	3	2	2	1
CO3	Analyze various authentication and key agreement protocols.	1	2	1	2	1	1		1				2	2	2	2	1
CO4	Realize the security threats caused by malware, design Firewall based solutions and access control techniques to solve societal security problems.	1	3	3	2	2	2		1				2	2	2	2	1
CO5	Investigate the need of security at different levels/layers and its services.	1	2	2	1	1	1		1				2	1	2	2	1
CO6	Understand cyber security and illustrate the need of cyber Law.	1	2		1		3		2				3		1	2	2

CO	PO	Level	Justification
CO1	PO1 PO2	Substantially	Strong Basics of mathematics and computer science will help the students to Identify, formulate and apply number theory in various cryptographic techniques and summarize its applications
	PO4	Slightly	analysis and interpretation of data helps student to identify cryptographic techniques
	PO12	Moderately	Various cryptographic techniques helps student to prepare for their professional career.
CO2	PO1 PO2 PO3	Substantially	Apply the knowledge of mathematics and basics of computer science to identify and formulate Design and develop simple cryptography algorithms for real world situation
	PO4 PO5 PO6	Moderately	Design, analysis and interpretation of data by applying appropriate techniques for designing solution to various authentication techniques
	PO8	Slightly	develop various cryptographic methods to apply norms of engineering practices.
CO3	PO1 PO3 PO5 PO6 PO8	Slightly	Basics of mathematics and computer science will help the students to identify , design and analyze various authentication and key agreement protocols using modern tools to apply professional ethics.
	PO2 PO4 PO12	Moderately	Identify, formulate and design process to analyze various authentication and key agreement protocols which help the students to engage in life long learning in the context of technological change.
CO4	PO1 PO8	Slightly	Apply the knowledge of computer science to analyze security threats caused by malware, design Firewall based solutions and access control techniques to solve societal security problems by practicing engineering norms
	PO2 PO3	Substantially	Identify, formulate, Design Firewall based solutions
	PO4 PO5 PO6	Moderately	design and analysis Firewall based solutions and access control techniques using modern tools to apply reasoning informed by the contextual knowledge to legal issues.
CO5	PO1 PO4 PO5 PO6 PO8	Slightly	Basics of computer science helps to Investigate the need of security at different levels/layers and its services using appropriate techniques to asses legal issues by appling engineering norms.
	PO2 PO3 PO12	Moderately	Identify, formulate, the need of security at different levels/layers and Recognize the need for, life long learning process.
CO6	PO1 PO4	Slightly	Apply the knowledge of engineering fundamentals to investigate the need for cyber security and illustrate the need of cyber Law
	PO2 PO8	Moderately	Identify and formulate the need for cyber security and cyber Law helps students to understand and commit to professional ethics
	PO6	Substantially	Apply reasoning informed by the contextual knowledge to assess cultural issues and the consequent responsibilities relevant to the professional engineering practice in the field of Computer science.

CO1	**PSO**	**Level**	**Justification**
	1	Substantially	Solid foundation in the principles of computer science including mathematics is required to Apply the basics of number theory in various Cryptographic techniques
	2 3	Moderately	With the knowledge of various cryptographic techniques students will have skills to function as members of multidisciplinary teams and to communicate effectively using modern tools and can be prepared for their careers.
CO2	1	Substantially	Solid foundation in maths and computer science is required to develop cryptographic algorithms.
	2 3	Moderately	Design and develop simple cryptography algorithms for real world situation using modern tools and can be prepared for their careers in IT industry
	4	Slightly	Cryptographic techniques help students to practice profession with ethics.
CO3	1 2 3	Moderately	Basics of computer science help the students to analyze various authentication and key agreement protocols using modern tools. These knowledge can help them in their careers or higher studies.
	4	Slightly	Authentication protocols and key agreement protocols help the students to practice their profession with ethics.
CO4	1 2 3	Moderately	With the Basics of computer science, students can realize the security threats caused by malware, design Firewall based solutions and access control techniques to solve societal security problems, which can be communicated effectively using modern tools and also help the students to build their careers.
	4	slightly	Students can practice their profession with ethics.
CO5	1 4	slightly	Basics of computer science help the students to Investigate the need of security at different levels/layers and its services. And help the students to understand the social responsibility.
	2 3	moderately	Security at different layers help the undergraduates to communicate effectively as members of multidisplinary teams.
CO6	2	Slightly	Graduates can understand cyber security and illustrate the need of cyber Law to function as a multidisplinary teams.
	3 4	Moderately	Understand cyber security and cyber Law help the graduates to develop their professional careers with ethics.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CSL76-ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING LABORATORY

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CSP77-PROJECT WORK PHASE 1

17CSP78	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Survey on various technological domains	3	3	2	1	-	-	-	-	1	-	2	-	1	-	2	-
CO2	Identify problem statement and objectives	2	2	2	1	-	-	-	-	-	-	-	-	1	-	2	-
CO3	Formulate different requirements, phases and functionalities	-	1	1	2	1	-	-	-	2	-	-	1	1	2	2	1
CO4	Design system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules	1	1	2	2	1	2	1	-	-	-	-	-	1	1	2	-
CO5	Build algorithms, code implementation, testing and validation	1	2	-	3	1	-	-	-	1	1	-	1	-	3	3	-
CO6	Prepare the project report	-	-	-	3	2	-	-	-	-	1	1	-	-	3	1	-

	PO	Level	Justification
CO1	PO1 PO2	Maps Substantial (High)	The students can able to survey on various technological domains and they can identify problem statement
	PO3 PO11	Maps Moderate (Medium)	Survey on different technological domains slightly hard for the students
	PO4 PO9	Maps Slight (Low)	Research based knowledge and research methods, analysis and interpretation of data and multidisciplinary task are difficult here
CO2	PO1 PO2 PO3	Maps Moderate (Medium)	Student required knowledge for identifying problem and creating problem statement and objectives
	PO4	Maps Slight (Low)	Student may require strong knowledge on research methods for analysis and implementation after the problem statements
CO3	PO4 PO9	Maps Moderate (Medium)	Student required knowledge for formulate different requirements, phases, functionalities and interdisciplinary actions
	PO2 PO3 PO5 PO12	Maps Slight (Low)	Student may require strong knowledge to formulate different requirements, phases, functionalities and interdisciplinary actions based on context of technological change.
CO4	PO3 PO4 PO6	Maps Moderate (Medium)	Designing and implementing of system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules will be complex process... Adopting ethical principles in multidisciplinary environments is tough task
	PO1 PO2 PO5 PO7	Maps Slight (Low)	The students required strong mathematical concepts and system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules solve complex problems. The student will have learn life-long in context of technological change
CO5	PO4	Maps Substantial (High)	The student have research-based knowledge and research methods including build algorithms, code implementation, testing and validation, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
	PO2	Maps Moderate (Medium)	The students can able build algorithms, code implementation, testing and validation
	PO1 PO5 PO9 PO10 PO12	Maps Slight (Low)	The students have to required strong mathematical knowledge for build algorithms, code implementation, testing and validation
CO6	PO4	Maps Substantial (High)	The students can able write project report on research methods including build algorithms, code implementation, testing and validation, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
	PO5	Maps Moderate (Medium)	The students can able to create project report /documents using modern tools and techniques

	PO10 PO11	Maps Slight (Low)	The students have to required write mathematical concepts in their project report and being able to comprehend and write effective reports and design documentation is low at the undergraduate level

	PSO	Level	Justification
CO1	PSO1	Maps Moderate (Medium)	The students have moderate knowledge on various technological domains through literature survey
	PSO3	Maps Slight (Low)	The graduates have limited opportunity to build their career in the software industry
CO2	PSO1	Maps Moderate (Medium)	The students have moderate knowledge on various technological domains to identify problem statement and to set objectives
	PSO3	Maps Slight (Low)	The graduates have limited opportunity in industry just by identifying problem statement and objectives
CO3	PSO1 PSO4	Maps Moderate (Medium)	The students have moderate knowledge on various technological domains to formulate different requirements and functionalities of different phases.
	PSO2 PSO3	Maps Slight (Low)	The graduates have limited opportunity in industry by knowing different functionalities and requirements.
CO4	PSO1 PSO2	Maps Moderate (Medium)	The students have moderate knowledge in designing a software system through system architecture, DFD, different modules
	PSO3	Maps Slight (Low)	The graduates have limited opportunity in software industry or pursue higher studies
CO5	PSO2 PSO3	Maps Substantial (High)	The students will able to design, build algorithms, code implementation, testing and validation of project which enable greater opportunities to work in IT industries.
CO6	PSO1 PSO2	Maps Substantial (High)	The students are able to prepare the best project report by having domain knowledge and effective communication for best business opportunities
	PSO3	Maps Slight (Low)	The graduates have limited opportunity to pursue higher studies

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS81-INTERNET OF THINGS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Interpret the impact and challenges posed by IoT networks leading to new architectural models.	3	2	2	-	-	1	-	-	-	-	-	2	3	2	1	-
CO2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.	3	-	1	1	-	1	-	-	-	-	-	1	1	2	1	-
CO3	Appraise the role of IoT protocols for efficient network communication.	3	2	1	1	-	-	-	-	-	-	-	2	2	-	1	-
CO4	Elaborate the need for Data Analytics and Security in IoT.	2	1	1	-	1	-	-	1	-	-	-	2	2	2	1	1
CO5	Illustrate different sensor technologies for sensing real world entities	3	2	2	-	1	-	2	-	-	-	-	3	1	-	1	-
CO6	Explore the applications of IoT in Industry	2	1	1	-	1	-	1	-	-	-	-	2	1	2	1	-

CO 1	**PO**	**Level**	**Justification**
	PO1	Maps Strongly	The knowledge of basics of mathematical and engineering principles help students to demonstrate the principles of different architecture. Analysis of different elements of architecture help students to understand the existing system.
	PO2 PO3 PO12	Maps moderately	Development of any new standardization architecture needs analysis and design procedures of new elements and understanding the impact on societal and environmental contexts. Lifelong learning required to bring in the new developments in the upcoming applications.
	PO6	Maps slightly	Some of the tools are explored.
CO2	PO1	Maps Strongly	The knowledge of basics of mathematical and engineering principles help students for the smart object analysis.
	PO3 PO4 PO6 PO12	Maps slightly	design procedures of new connecting and understanding the impact on societal and environmental contexts.
CO3	PO1	Maps Strongly	It helps students to come up with design strategies of any modifications required and induces life long learning
	PO2 PO12	Maps moderately	Networking concepts are applied in various domains and hence it is relevant to relate network layer services to understand the impact of the professional engineering solutions in societal and environmental contexts and lifelong learning.
	PO3 PO4	Maps slightly	IoT protocols are used by students for complex problems.
CO4	PO1 PO12	Maps moderately	Networking concepts are applied in various domains in day to day activities and hence induces life long learning. Tools like NS3 help students to realize the working of protocols.The knowledge of strong basics of mathematical and engineering principles help students to demonstrate the principles of application layer protocols.
	PO2 PO3 PO5 PO8	Maps slightly	It enables students to debug solutions for complex problems.
CO5	PO1 PO12	Maps Strongly	Frequent upgrades of Data Analytics induce life long learning and the environment friendly impact on design and utilization of servers are important.
	PO2 PO3 PO7	Maps moderately	Environment friendly impact on design and utilization of server data are important.
	PO5	Maps slightly	The knowledge of basics of mathematical and engineering principles help students for the transport layer analysis and design procedures of new analytics techniques and understanding the impact on societal and environmental contexts.

CO6	PO1 PO12	Maps moderately	Applications to industry and regular updates in the domain leads to lifelong learning.
	PO2 PO3 PO5 PO7	Maps slightly	Optimal applications are considered to be effective in optimal environmental conditions and minimal resource usage. The knowledge of mathematical and engineering principles help students for the applications and analysis.

	PSO	Level	Justification
CO1	PSO1	Maps Strongly	Architecture design concepts are applied in various domains and hence students will gain skills to function as members of multi-disciplinary teams.
	PSO2	Maps moderately	Architecture design concepts are applied in various domains and hence students will gain skills to function as members of multi-disciplinary teams.
	PSO3	Maps slightly	
CO2	PSO2	Maps moderately	Architecture analysis and new implementation and standardization requires lifelong learning.
	PSO1 PSO3	Maps slightly	Knowledge of different sensors and Actuators is essential.
CO3	PSO1	Maps moderately	The knowledge of strong basics of mathematical principles and computer architecture will help the students to identify and apply functionalities of different network layer protocols.
	PSO3	Maps slightly	Development of any new network layer protocol needs the understanding of its working in multidisciplinary environment and requires longevity of learning
CO4	PSO1 PSO2	Maps moderately	Networking concepts are applied in various domains in day to day activities and hence induces life long learning.
	PSO3 PSO4	Maps slightly	The knowledge of strong basics of mathematical and engineering principles help students to demonstrate the principles of application layer protocols. It enables student in Debugging solutions for complex problems.
CO5	PSO1	Maps moderately	Frequent upgrades of Data Analytics technique induces life long learning.
	PSO3 PSO3	Maps slightly	The knowledge of mathematical principles and basics of computer science will help the students to understand the concepts of different analytic principles and overview
CO6	PSO2	Maps moderately	Application of IOT in different fields is multidisciplinary and regular updates in the domain leads to life long learning.
	PSO1 PSO3	Maps slightly	Solid foundation in mathematical and science fundamentals is important for the different applications of IOT.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS822- STORAGE AREA NETWORKS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Examine the Storage Area Networks characteristics, components and storage architectures	1											1	1		1	1
CO2	Exemplify the concept of RAID and their suitability for different application environments	1	2	1	1								1	1		1	1
CO3	Depict the concepts of FC SAN, iSCSI, and FCIP	1	1										1	1		1	1
CO4	Analyze file sharing operations on NAS and IP-SAN of the different networks	1											1	1		1	1
CO5	Illustrate the concepts of business continuity and disaster recovery in a storage infrastructure	1											1	1		1	1

CO6	**Demonstrate the Knowledge of Securing the local replication in Storage Infrastructure and Cloud**	1										1	1		1	1

CO	PO	Mapping level	Justification
CO1	Slightly	Slightly	As the students are required to focus on the fundamentals of Storage Area Networks characteristics, components and storage architectures.
CO2	PO2	Moderately	Students can gain concept of RAID and their suitability for different application environments gives the orientation towards problem solving capability
	PO 1 PO 3 PO 4	Slightly	Maps slightly to the Knowledge on RAID and the different application environments as it leads towards enhancing the basic fundamental problem solving capability.
CO3	PO1 PO2 PO12	Slightly	Analysis of file sharing operations on NAS and IP-SAN of the different networks helps them to apply the engineering knowledge which leads to identify the problem statement.
CO4	PO1 PO12	Slightly	Students can have basic knowledge on the working of Storage Virtualization on Various levels of Storage at this level which will be helpful to apply gained knowledge in future
CO5	PO1 PO12	Slightly	As the Students are able to only Illustrate the concepts of business continuity and disaster recovery in a storage infrastructure it maps slightly.
CO6	PO1 PO12	Slightly	Students can Demonstrate the Knowledge of Securing the local replication in Storage Infrastructure and Cloud.

CO	PSO	Mapping level	Justification
CO1	PSO 1 PSO 3 PSO 4	Slightly	Graduates will use the solid foundation in the principles of computer science to understand Storage Area Networks characteristics, components and storage architectures during their career in software industry or while pursuing higher studies.
CO2	PSO 1 PSO 3 PSO 4	Slightly	Graduates will use the solid foundation in the principles of computer science to interpret the concept of RAID and their suitability for different application environments during their career in software industry or while pursuing higher studies.
CO3	PSO 1 PSO 3 PSO 4	Slightly	Graduates will use the solid foundation in the principles of computer science to analyze file sharing operations on NAS and IP-SAN of the different networks during their career in software industry or while pursuing higher studies.
CO4	PSO 1 PSO 3 PSO 4	Slightly	Graduates will use the solid foundation in the principles of computer science to develop the capability to analyze working of Storage Virtualization on Various levels of Storage during their career in software industry or while pursuing higher studies.
CO5	PSO 1 PSO 3 PSO 4	Slightly	Graduates will use the solid foundation in the principles of computer science Illustrate the concepts of business continuity and disaster recovery in a storage infrastructure during their career in software industry or while pursuing higher studies.
CO6	PSO 1 PSO 3 PSO 4	Slightly	Graduates will use the solid foundation in the principles of computer science to Demonstrate the Knowledge of Securing the local replication in Storage Infrastructure and Cloud during their career in software industry or while pursuing higher studies.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS823-NOSQL DATABASE

CO	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Recall NoSQL Basics, types and relate with Relational Database.	2	-	2	-	-	-	-	-	1	-	-	1	3	1	1	-
CO2	Compare and contrast the benefits of four types of NoSQL Databases Document-oriented, KeyValue Pairs, Column-oriented and Graph databases.	3	2	3	2	-	-	1	-	1	-	-	2	2	1	1	-
CO3	Interpret Graph database and data models	2	1	1	1	3	-	-	-	2	-	-	3	3	3	3	-

CO4	Examine the detailed architecture of Column-oriented NoSQL database.	1	-	3	1	3	-	1	1	2	-	-	2	2	3	2	1
CO5	Illustrate query performance and document oriented NoSQL database .	2	2	2	2	-	-	-	-	-	-	-	2	2	1	2	-
CO6	Demonstrate the Map Reduce processing technique and Key Value Databases with examples	1	-	1	2	2	-	1	1	1	-	-	2	2	2	2	1

CO1	PO	Level	Justification
	PO1 PO3	Moderately	Fundamental knowledge of mathematics, science, engineering are used by students to represent database with different data modeling concepts and design solutions for complex engineering problems.
	PO9 PO12	Slightly	Students are able to function effectively as an individual and team and engage in independent and life-long learning.
CO2	PO2 PO4 PO12	Moderately	Students are able to Identify, formulate,analyze complex engineering problems by designing simple database design and conduct investigations. Engage in independent and life-long learning.
	PO7 PO9	Slightly	Design simple database systems by applying ethical principles and commit to professional ethics and responsibilities and Function effectively as an individual and team.
	PO1 PO3	Substantially	To design and develop database system student apply Fundamental knowledge of mathematics, science, engineering
CO3	PO1 PO9	Moderately	Students can Build and manipulate database using SQL by applying fundamental knowledge of engineering and work in team and as individuals
	PO5 PO12	Substantially	Student use modern tools to build and manipulate database. Engage in independent and life-long learning.
	PO2 PO3 PO4	Slightly	Using SQL students can identify,formulate and design solutions for complex engineering problems.

CO4	PO1 ,PO4 PO7 PO8	Slightly	Students can design and develop database applications by applying fundamental knowledge of mathematics, science, engineering using modern tools for sustainable development. Ethics to be practiced in design and development.
	PO9 PO12	Moderately	Students can design and develop database applications individually or in team,it is a life long learning process in context of technological change.
	PO3 PO5	Substantially	Design solutions for complex engineering problems using modern tools.
CO5	PO1,PO2 ,PO3 PO4 PO12	Moderately	Analyze and apply normalization for better database design and development.by applying fundamentals of mathematics, science, and engineering in the context of changing technology.
CO6	PO1 PO3 PO7 PO8 PO9	slightly	Demonstrate the use of concurrency control and transaction processing by applying fundamental knowledge for real world problems with transparency in societal and environmental contexts.
	PO4 PO5 PO12	moderately	Using database tools to achieve concurrency,database consistency for real world problems.

CO1	**PSO**	**Level**	**Justification**
	PSO1	moderately	Graduates of the Program will have solid foundation in Represent database with different data modeling concepts.
	PSO2 PSO3	slightly	The graduates of the Program will have skills to function as member of database development team and to perform effectively in the software industry
CO2	PSO1	moderately	The graduates of the Program will have solid foundation to design simple database systems.
	PSO2 PSO3	slightly	The graduates of the Program will have skills to function as member of database development team and to perform effectively in the software industry
CO3	PSO1 PSO2 PSO3	Substantially	The graduates of the Program will have solid foundation in the principles and practices of database development in the software industry and to communicate effectively using modern tools.
CO4	PSO1 PSO3	moderately	The graduates of the Program will have solid foundation for design and development of database applications in the software industry

	PSO2	Substantially	The graduates of the Program will have skills to function as members of multi-disciplinary teams and to communicate effectively using modern tools for development of database applications.
	PSO4	slightly	The graduates of the program will practice the profession with ethics and integrity
CO5	PSO1 PSO3	moderately	The graduates of the Program will have solid foundation to Analyze and apply normalization for better database design in the software industry
	PSO2	slightly	The graduates of the Program will have skills to function as members of database development team byapply normalization for better database design using modern tools.
CO6	PSO1 PSO2 PSO3	moderately	The graduates of the Program will have solid foundation to implement concurrency control and transaction processing in database development process.
	PO4	slightly	The graduates of the program will practice the profession with ethics to achieve transparency in database transactions.

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CS54-AUTOMATA THEORY & COMPUTABILITY

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation	3	3	3	2								2	3	1		-
CO2	Translate between different models of Computation	2	3	3	2								2	2	2		-
CO3	Design Grammars and Automata for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.	2	2	2	2			1					1	2	2	2	-
CO4	Apply rigorously formal mathematical methods to prove properties of languages, grammars and automata	2	2	2	2			1					1	2	2	2	
CO5	Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness.	2	1	1	3								2			2	
CO6	Classify a problem with respect to different models of Computation	2	1	1	1								2			2	

CO1	PO	Level	Justification
	PO1 PO2 PO3	Substantially	Knowledge of mathematics, engg fundamentals will help the student to identify ,formulate And analyze to develop engg. Problems.

	PO4 PO12	Moderately	Core concepts help students to design,analyze and interpret the data and to model any real time problem.
CO2	PO1 PO4 PO12	Moderately	Apply of engg. Fundamentals helps students to synthesize model translation which helps for real time situation.
	PO2 PO3	Substantially	Identify, formulate and design solution for different models translation.
CO3	PO1, PO2 PO3 ,PO4	Moderately	Identify, formulate and design solution for research based problems using grammars and automata.
	PO7 PO12	Slightly	Mathematical model of automata and grammars are required for real-time solutions.
CO4	PO1 , PO2 PO3 ,PO4	Moderately	Identify,formulate,design solution for research problems using properties of automata and grammars.
	PO7 PO12	Slightly	Mathematical model of automata and grammars are required for real-time solutions.
CO5	PO1 PO12	Moderately	Knowledge of mathematics and basics of computer will help the students to build reduced formal models.
	PO2 PO3	Slightly	Identify and design solution to reduce the formal models.
	PO4	Substantially	Complex problems are analyzed using formal models.
CO6	PO1 PO12	Moderately	Engg. Fundamentals help students for real-time problems.
	PO2, PO3 PO4	Slightly	Identify formulate design solutions for research based problems using different models of computation.

	PSO	**Level**	**Justification**
CO1	PSO1	Substantially	Fundamental understanding of the core concepts in automata theory and Theory of Computation will give solid foundation.
	PSO2	Slightly	Fundamental understanding of the core concepts in automata theory and Theory of Computation will give skills in multi-disciplinary teams and to communicate effectively using modern tools
CO2	PSO1 PSO2	Moderately	Translation between different models will give solid foundation and skills in multi-disciplinary teams.
CO3	PSO1 PSO2, PSO3	Moderately	Designing Grammars and Automata will give solid foundation ,skills in multi-disciplinary teams and can pursue higher studies in theory of computation or formal modelling.
CO5	PSO3	Moderately	Developing skills in formal reasoning will help students to pursue higher studies in theory of computation or formal modelling.

CO6	PSO3	Moderately	Classifying a problem with respect to different models of Computation will give idea to pursue higher studies in theory of computation or formal modelling.



RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CSP83 -PROJECT WORK PHASE 2

15CS85	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4

CO1	Continuation of project work implementation as suggested by review committee	1	2	-	3	1	-	-	-	1	1	-	1	-	3	3	-
CO2	Monitoring of project by project review committee.	2	2	2	1	-	-	-	-	-	-	-	-	1	-	2	-
CO3	Update different requirements, phases and functionalities	-	1	1	2	1	-	-	-	2	-	-	1	1	2	2	1
CO4	Design system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules	1	1	2	2	1	2	1	-	-	-	-	-	1	1	2	-
CO5	Build algorithms, code implementation, testing and validation	1	2	-	3	1	-	-	-	1	1	-	1	-	3	3	-
CO6	Prepare the project work 2 report	-	-	-	3	2	-	-	-	-	1	1	-	-	3	1	-

	PO	Level	Justification
CO1	PO4	Maps Substantial (High)	The student have continue to build algorithms, code implementation, testing and validation, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
	PO2	Maps Moderate (Medium)	The students can able build algorithms, code implementation, testing and validation
	PO1 PO5 PO9 PO10 PO12	Maps Slight (Low)	The students have to required strong mathematical knowledge for build algorithms, code implementation, testing and validation
CO2	PO1 PO2 PO3	Maps Moderate (Medium)	Student will be monitoring of project by project review committee.
	PO4	Maps Slight (Low)	Student may require strong knowledge on research methods for analysis and implementation as suggested by review committee.
CO3	PO4 PO9	Maps Moderate (Medium)	Student required knowledge for formulate different requirements, phases, functionalities and interdisciplinary actions
	PO2 PO3 PO5 PO12	Maps Slight (Low)	Student may require strong knowledge to formulate different requirements, phases, functionalities and interdisciplinary actions based on context of technological change.
CO4	PO3 PO4 PO6	Maps Moderate (Medium)	Designing and implementing of system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules will be complex process... Adopting ethical principles in multidisciplinary environments is tough task
	PO1 PO2 PO5 PO7	Maps Slight (Low)	The students required strong mathematical concepts and system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules solve complex problems. The student will have learn life-long in context of technological change
CO5	PO4	Maps Substantial (High)	The student have research-based knowledge and research methods including build algorithms, code implementation, testing and validation, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
	PO2	Maps Moderate (Medium)	The students can able build algorithms, code implementation, testing and validation
	PO1 PO5 PO9 PO10 PO12	Maps Slight (Low)	The students have to required strong mathematical knowledge for build algorithms, code implementation, testing and validation
CO6	PO4	Maps Substantial (High)	The students can able write project report on research methods including build algorithms, code implementation, testing and validation, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
	PO5	Maps Moderate (Medium)	The students can able to create project report /documents using modern tools and techniques

	PO10	Maps Slight	The students have to required write mathematical concepts in their project report and being able to comprehend and write effective

	PO11	(Low)	reports and design documentation is low at the undergraduate level

	PSO	Level	Justification
CO1	PSO2 PSO3	Maps Substantial (High)	The students will able to design, build algorithms, code implementation, testing and validation of project which enable greater opportunities to work in IT industries.
CO2	PSO1	Maps Moderate (Medium)	The students have moderate knowledge on various technological domains and the project review committee Monitoring on their progress
	PSO3	Maps Slight (Low)	The graduates have limited opportunity in industry just by identifying problem statement and objectives
CO3	PSO1 PSO4	Maps Moderate (Medium)	The students have moderate knowledge on various technological domains to formulate different requirements and functionalities of different phases.
	PSO2 PSO3	Maps Slight (Low)	The graduates have limited opportunity in industry by knowing different functionalities and requirements.
CO4	PSO1 PSO2	Maps Moderate (Medium)	The students have moderate knowledge in designing a software system through system architecture, DFD, different modules
	PSO3	Maps Slight (Low)	The graduates have limited opportunity in software industry or pursue higher studies
CO5	PSO2 PSO3	Maps Substantial (High)	The students will able to design, build algorithms, code implementation, testing and validation of project which enable greater opportunities to work in IT industries.
CO6	PSO1 PSO2	Maps Substantial (High)	The students are able to prepare the best project report by having domain knowledge and effective communication for best business opportunities
	PSO3	Maps Slight (Low)	The graduates have limited opportunity to pursue higher studies

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CSS84-TECHNICAL SEMINAR

RNS INSTITUTE OF TECHNOLOGY
(AICTE Approved and VTU Affiliated)
CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

18CSI85-INTERNSHIP

18CSI85	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Gain Knowledge on various technological domains in real time	3	3	2	1	-	-	-	-	1	-	2	-	1	-	2	-
CO2	Learn and develop specific skillset for implementing project.	2	2	2	1	-	-	-	-	-	-	-	-	1	-	2	-
CO3	Organize/plan of project design and develop in specific stipulated time	-	1	1	2	1	-	-	-	2	-	-	1	1	2	2	1
CO4	Prepare the detailed internship project work report	1	1	2	2	1	2	1	-	-	-	-	-	1	1	2	-
CO5	Build a record of work experience from internship work	1	2	-	3	1	-	-	-	1	1	-	1	-	3	3	-
CO6	Search and apply for a job after the course completion	-	-	-	3	2	-	-	-	-	1	1	-	-	3	1	-

	PO	Level	Justification
CO1	PO1 PO2	Maps Substantial (High)	The students can able to Gain Knowledge on various technological domains in real time
	PO3 PO11	Maps Moderate (Medium)	Gain Knowledge on various technological domains in real time on different technological domains slightly hard for the students
	PO4 PO9	Maps Slight (Low)	Research based knowledge and research methods, analysis and interpretation of data and multidisciplinary task are difficult here
CO2	PO1 PO2 PO3	Maps Moderate (Medium)	Student required Learn and develop specific skillset for implementing project
	PO4	Maps Slight (Low)	Student may require strong knowledge on research methods for analysis and implementation after the Learn and develop specific skillset
CO3	PO4 PO9	Maps Moderate (Medium)	Student required knowledge for Organize/plan of project design and develop in specific stipulated time and interdisciplinary actions
	PO2 PO3 PO5 PO12	Maps Slight (Low)	Student may require Organize/plan of project design and develop in specific stipulated time on context of technological change.
CO4	PO3 PO4 PO6	Maps Moderate (Medium)	Designing and implementing of system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules Prepare the detailed internship project work report
	PO1 PO2 PO5 PO7	Maps Slight (Low)	The students required strong mathematical concepts and system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules solve complex problems. The student will have Prepare the detailed internship project work report on their internship work
CO5	PO4	Maps Substantial (High)	The student have research-based knowledge and research methods including build algorithms, code implementation, testing and validation, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
	PO2	Maps Moderate (Medium)	The students can able Build a record of work experience from internship work on build algorithms, code implementation, testing and validation
	PO1 PO5 PO9 PO10 PO12	Maps Slight (Low)	The students have to required strong mathematical knowledge for build a record of work experience from internship work
CO6	PO4	Maps Substantial (High)	The students can able Search and apply for a job after the course completion
	PO5	Maps Moderate (Medium)	The students can able to create project report /documents and apply for a job after the course completion
	PO10 PO11	Maps Slight (Low)	The students have to required to Search and apply for a job after the course completion t is low at the undergraduate level

	PSO	Level	Justification
CO1	PSO1	Maps Moderate (Medium)	The students have moderate Knowledge on various technological domains in real time
	PSO3	Maps Slight (Low)	The graduates have limited Knowledge on various technological domains in real time for the software industry
CO2	PSO1	Maps Moderate (Medium)	The students have moderate knowledge for Learn and develop specific skillset for implementing project.
	PSO3	Maps Slight (Low)	The graduates have limited opportunity in industry just by limited skillset for implementing project.
CO3	PSO1 PSO4	Maps Moderate (Medium)	The students have moderate knowledge on Organize/plan of project design and develop in specific stipulated time
	PSO2 PSO3	Maps Slight (Low)	The graduates have limited opportunity in industry by knowing Organize/plan of project design and develop in specific stipulated time
CO4	PSO1 PSO2	Maps Moderate (Medium)	The students have moderate knowledge in Prepare the detailed internship project work report
	PSO3	Maps Slight (Low)	The graduates have limited opportunity in software industry or pursue higher studies by Prepare the detailed internship project work report
CO5	PSO2 PSO3	Maps Substantial (High)	The students will able to Build a record of work experience from internship work to work in IT industries.
CO6	PSO1 PSO2	Maps Substantial (High)	The students are able to Search and apply for a job after the course completion for best business opportunities
	PSO3	Maps Slight (Low)	The graduates have limited job after the course completion to pursue higher studies or in industry

18CS32 -DATA STRUCTURE AND APPLICATIONS

		Program Outcomes												Program Specific Outcomes			
	Course Outcomes	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	Demonstrate and classify various data structures and their primitive operations	2	1										1	2			
CO2	Apply the concepts of arrays and strings in sorting and pattern matching applications	3	3	3	2	1							1	3		1	
CO3	Implement the operations of linear data structures like stacks, queues and linked lists.	3	3	2	2	2							1	3	1	1	
CO4	Demonstrate primitive operations on different types of trees and their applications	3	3	2	2	2							1	3	1	1	
CO5	Summarize the concepts of graphs, traversal techniques, hashing and file handling.	2	2	2	2	3							1	3	1	1	1
CO6	Design and develop solutions approaches to solve various computing problemsb y choosing appropriate data structures	3	3	3	3	3			1	1			2	2	3	3	1

18CS33 -ANALOG & DIGITAL ELECTRONICS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Analyse the performance of FETs, Opamp circuits and their applications.	2	2	2	-	-	-	-	-	-	-	1	1	2	-	-	-
CO2	Apply simplification (SOP/POS) techniques to combinational logic circuits/expressions.	3	2	3	2	1	-	-	-	-	-	1	-	2	1	1	-
CO3	Analyze and design various data processing circuits .	3	3	2	2	-	-	-	-	-	-	1	1	2	2	1	-
CO4	Realize the working of various flip flops and their applications.	2	2	2	2	-	-	-	-	-	-	1	1	2	1	1	-
CO5	Interpret and analyze the performance of A/D and D/A converters.	2	1	1	-	-	-	-	-	-	-	-	1	1	1	1	-
CO6	Implement logic circuits using HDL models	2	-	-	1	2	-	-	-	-	-	-	1	1	2	-	-

18CS34 -COMPUTER ORGANIZATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Visualize the basic building blocks of computer.	3											2	3		2	
CO2	Analyze the programs as sequence of machine instructions.	3	2										2	2			
CO3	Explore different ways of communicating with I/O devices and interfaces.	3											2	2			
CO4	Design and evaluate the performance of memory systems.	3	2	3	1								1	3	2	1	
CO5	Demonstrate arithmetic and logical operations with integer and floating point operands.	3	3	3	2	1							1	3	2		
CO6	Analyze the basic functional units of processor.	3	2	3	1								1	3	2	2	

18CS35 - Software Engineering

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Assess professional and ethical responsibility, software engineering principles and activities involved in building large software programs.	1					3		3	1	1		2	1	1	2	3
CO2	Demonstrate the process of requirements gathering, classification, specification and validation.	1			2	1	2		1	2	2		2	1	2	2	1
CO3	Outline the concepts of object-oriented and modeling	1											3	2		2	1
CO4	Design models for software system, component and process within realistic constraints.	2	1	3	3	2	1	1	1	2	1	1	2	1	3	2	1
CO5	Apply, design, implement, verify, validate and maintain software systems with metrics	2	2	3	3	1	1	1	1	1	1	1	2	2	2	3	1
CO6	Apply cost estimation and time scheduling for quality project activities.	3	1	2	3	2	1	2	1	2	1	3	3	2	1	2	2

18CS36 –DISCRETE MATHEMATICAL STRUCTURES

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify the correctness of propositional log and truth tables.	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO2	Make use of counting techniques mathematical induction, permutations an combinations to solve problems.	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO3	Analyze and develop partial orders, relations and functions.	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO4	Analyze the use of principle of inclusion exclusion, derangements and recurrenc relations	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO5	Analyze and develop types of graphs and trees.	2	1	1	-	-	-	-	-	-	-	-	1	1			

18CSL38-DS LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Solve computational problems using basic C language constructs.	3	3	1	1	1	-	-	-	2	-	-	3	3	1	3	-
CO2	Design and implement operations on both single and Multidimensional arrays.	3	2	3	1	1	-	-	-	1	2	-	3	3	1	2	-
CO3	Develop menu driven programs to demonstrate primitive operations on stacks and queues	3	3	2	1	1	-	-	-	1	2	-	2	3	1	2	-
CO4	Assess the operations on different types of Trees.	3	3	2	-	1	-	-	-	1	2	-	2	3	1	3	-
CO5	Demonstrate traversal techniques on graphs	2	3	2	1	1	-	-	-	1	2	-	2	3	1	3	-
CO6	Apply ap pr opr i a t e data s t r u c t u r e s to solve computing problems	3	2	3	2	2	2	-	1	2	1	2	3	3	1	2	1

18CS32 -DATA STRUCTURE AND APPLICATIONS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate and classify various data structures and their primitive operations	2	1										1	2			
CO2	Apply the concepts of arrays and strings in sorting and pattern matching applications	3	3	3	2	1							1	3		1	
CO3	Implement the operations of linear data structures like stacks, queues and linked lists.	3	3	2	2	2							1	3	1	1	
CO4	Demonstrate primitive operations on different types of trees and their applications	3	3	2	2	2							1	3	1	1	
CO5	Summarize the concepts of graphs, traversal techniques, hashing and file handling.	2	2	2	2	3							1	3	1	1	1
CO6	Design and develop solutions approaches to solve various computing problemsb y choosing appropriate data structures	3	3	3	3	3			1	1			2	2	3	3	1

18CS33 -ANALOG & DIGITAL ELECTRONICS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Analyse the performance of FETs, Opamp circuits and their applications.	2	2	2	-	-	-	-	-	-	-	1	1	2	-	-	-
CO2	Apply simplification (SOP/POS) techniques to combinational logic circuits/expressions.	3	2	3	2	1	-	-	-	-	-	1	-	2	1	1	-
CO3	Analyze and design various data processing circuits .	3	3	2	2	-	-	-	-	-	-	1	1	2	2	1	-
CO4	Realize the working of various flip flops and their applications.	2	2	2	2	-	-	-	-	-	-	1	1	2	1	1	-
CO5	Interpret and analyze the performance of A/D and D/A converters.	2	1	1	-	-	-	-	-	-	-	-	1	1	1	1	-
CO6	Implement logic circuits using HDL models	2	-	-	1	2	-	-	-	-	-	-	1	1	2	-	-

18CS34 -COMPUTER ORGANIZATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Visualize the basic building blocks of computer.	3											2	3		2	
CO2	Analyze the programs as sequence of machine instructions.	3	2										2	2			
CO3	Explore different ways of communicating with I/O devices and interfaces.	3											2	2			
CO4	Design and evaluate the performance of memory systems.	3	2	3	1								1	3	2	1	
CO5	Demonstrate arithmetic and logical operations with integer and floating point operands.	3	3	3	2	1							1	3	2		
CO6	Analyze the basic functional units of processor.	3	2	3	1								1	3	2	2	

18CS35 - Software Engineering

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Assess professional and ethical responsibility, software engineering principles and activities involved in building large software programs.	1					3		3	1	1		2	1	1	2	3
CO2	Demonstrate the process of requirements gathering, classification, specification and validation.	1			2	1	2		1	2	2		2	1	2	2	1
CO3	Outline the concepts of object-oriented and modeling	1											3	2		2	1
CO4	Design models for software system, component and process within realistic constraints.	2	1	3	3	2	1	1	1	2	1	1	2	1	3	2	1
CO5	Apply, design, implement, verify, validate and maintain software systems with metrics	2	2	3	3	1	1	1	1	1	1	1	2	2	2	3	1
CO6	Apply cost estimation and time scheduling for quality project activities.	3	1	2	3	2	1	2	1	2	1	3	3	2	1	2	2

18CS36 –DISCRETE MATHEMATICAL STRUCTURES

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Identify the correctness of propositional log and truth tables.	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO2	Make use of counting techniques mathematical induction, permutations and combinations to solve problems.	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO3	Analyze and develop partial orders, relations and functions.	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO4	Analyze the use of principle of inclusion exclusion, derangements and recurrence relations	2	1	1	-	-	-	-	-	-	-	-	1	1			
CO5	Analyze and develop types of graphs and trees.	2	1	1	-	-	-	-	-	-	-	-	1	1			

18CSL37-ADE LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO 4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Utilize various electronic devices to design and construct the analog circuits	2	2	1	-	-	-	-	-	-	-	1	-	1	-	-	-
CO2	Use simulation package like multisim to design analog circuits.	-	-	1	-	3	-	-	-	1	-	1	-	1	2	-	-
CO3	Use various digital integrated circuits in the design and demonstration of various combinational logic and data processing circuits	2	1	3	-	-	-	-	-	-	-	1	1	3	-	1	-
CO4	Design and demonstrate various types of sequential circuits using flip flops.	2	-	3	-	-	-	-	-	-	-	1	1	2	-	1	-
CO5	Use simulation package like modelsim to design various digital circuits.	-	-	1	-	3	-	-	-	1	-	1	-	1	2	-	-
CO6	Understand the working and implementation of DAC and ALU	2	1	1	-	-	-	-	-	-	-	1	1	1	-	-	-

18CSL38-DS LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Solve computational problems using basic C language constructs.	3	3	1	1	1	-	-	-	2	-	-	3	3	1	3	-
CO2	Design and implement operations on both single and Multidimensional arrays.	3	2	3	1	1	-	-	-	1	2	-	3	3	1	2	-
CO3	Develop menu driven programs to demonstrate primitive operations on stacks and queues	3	3	2	1	1	-	-	-	1	2	-	2	3	1	2	-
CO4	Assess the operations on different types of Trees.	3	3	2	-	1	-	-	-	1	2	-	2	3	1	3	-
CO5	Demonstrate traversal techniques on graphs	2	3	2	1	1	-	-	-	1	2	-	2	3	1	3	-
CO6	Apply ap pr opr i a t e data s t r u c t u r e s to solve computing problems	3	2	3	2	2	2	-	1	2	1	2	3	3	1	2	1

18CS51-MANAGEMENT ENTREPRENEURSHIP FOR IT INDUSTRY

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Comprehend Management activities	1		1	1		1	1		1		2	2	1	1	1	1
CO2	Emphasize Entrepreneur concepts and outline their importance in entrepreneurship	1	1	1	2		1	1	1	2		2	1	1	1	2	1
CO3	Apply Enterprise Resource Planning (ERP) solutions for IT industry	3	3	3	3		1	3	1	2		1	1	3	2	3	1
CO4	Propose the methods for establishing micro, small and large scale enterprises	1	2	2	2		1	1	2	1		1	1	1		1	2
CO5	Apply IPRs and institutional support for entrepreneurship	1	1	2	1		1	3	3	1	2	1	2	2		1	2
CO6	Prepare project report for IT industry based on feasibility studies	3	3	3	3		3	3	2	3	3	1	3	3		3	1

18CS52-COMPUTER NETWORKS AND SECURITY

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate the principles of application layer protocols.	3	2	1			1	1					2	3	1	2	
CO2	Distinguish transport layer services and protocols.	3	3	2	2	3	1	1					2	3	1	2	
CO3	Classify IP and Routing Algorithms in network layer.	3	3	2	3	3	1	1					2	3	2	2	
CO4	Demonstrate the basic concepts of network Security.	2	1		2	3	1	1					3	2	1	3	
CO5	Exemplify Network support for multimedia.	1			1		1	1					1	1	1	2	
CO6	Illustrate the basic concepts of VOIP.				1		1						1			1	

18CS53-DATABASE MANAGEMENT SYSTEM

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Represent database with different data modeling concepts.	2	-	2	-	-	-	-	-	1	-	-	1	3	1	1	-
CO2	Design simple database systems.	3	2	3	2	-	-	1	-	1	-	-	2	2	1	1	-
CO3	Use Structured Query Language (SQL) for building and manipulating database.	2	1	1	1	3	-	-	-	2	-	-	3	3	3	3	-
CO4	Develop application to interact with databases.	1	-	3	1	3	-	1	1	2	-	-	2	2	3	2	1
CO5	Analyze and apply normalization for better database design.	2	2	2	2	-	-	-	-	-	-	-	2	2	1	2	-
CO6	Demonstrate the use of concurrency control and transaction processing.	1	-	1	2	2	-	1	1	1	-	-	2	2	2	2	1

18CS54-AUTOMATA THEORY & COMPUTABILITY

		Program Outcomes												Program Specific Outcomes			
	Course Outcomes	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation	3	3	3	2								2	3	1		-
CO2	Translate between different models of Computation	2	3	3	2								2	2	2		-
CO3	Design Grammars and Automata for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.	2	2	2	2			1					1	2	2	2	-
CO4	Apply rigorously formal mathematical methods to prove properties of languages, grammars and automata	2	2	2	2			1					1	2	2	2	
CO5	Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness.	2	1	1	3								2			2	
CO6	Classify a problem with respect to different models of Computation	2	1	1	1								2			2	

18CS55 –APPLICATION DEVELOPMENET USING PYTHON

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Learn the syntax and semantics of Python programming language.	2	2	3		2							2	2	1	2	
CO2	Illustrate the process of structuring the data using lists, tuples and dictionaries.	2	2	3		2				1			2	2	1	2	
CO3	Demonstrate the use of built-in functions to navigate the file system.	2	2	3		2				1			2	2	1	2	
CO4	Implement the Object Oriented Programming concepts in Python.	2	2	3		2				1			2	2	1	3	
CO5	Appraise the need for working with various documents like Excel, PDF, Word and Others.	2	2	3	1	2		1		1	1	1	2	2	2	3	2
CO6	Demonstrate Web scrapping for different types of data.	2	2	3	1	2		1	2	1	1	1	2	2	2	3	2

18CS56-UNIX PROGRAMMING

CO		PO1	PO2	PO3	PO 4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Explain fundamentals of Unix operating system and File organization	1											1	1	1	1	
CO2	Analyze file attribute and shell interpretive life cycle	2	2	3	2	2							2	2	1	3	
CO3	Design and develop programs using shell scripting	3	3	3	2	2							2	2	1	3	
CO4	Examine Unix file APIs and Environment of Unix process	3	3	3	2	2							2	2	1	3	
CO5	Assess the importance of IPC methods and shared memory in UNIX	2	3	3	2	2							2	2	1	3	
CO6	Evaluate the importance of signals and daemon processes.	3	3	3	2	2							2	2	1	3	

: COMPUTER NETWORKING LAB (18CSL57)

	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Demonstrate error detection technique using CRC	2	3	1	2						2	1	2	2	1	1	
CO2	Analyze and compare different routing protocols	2	2	1	2						2	1	2	2	1	1	
CO3	Implement connection-oriented and connection-less protocols in the network	2	2	1							2	1	2	2	1	1	
CO4	Demonstrate security features in networks using RSA algorithm	2	2	1	2				1		2	1	2	2	1	1	1
CO5	Analyze techniques to avoid congestion in the network	2	2	1	2						2	1	2	1	1	1	1
CO6	Implement, analyze and evaluate networking protocols using NS3 Tool	2	1			2					1		1	1	1		

18CSL58-DBMS WITH MINI PROJECT LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Demonstrate DDL commands on Database.	1	-	1	-	-	-	-	-	-	-	-	-	1	-	1	
CO2	Create ER diagrams and conceptual schema for the problems given.	2	1	2	1	-	-	-	-	-	-	1	-	2	2	2	
CO3	Apply Integrity constraints on relations.	2	2	2	1	-	-	-	-	-	-	1	-	2	2	2	
CO4	Demonstrate Update operations.	1	-	1	-	-	-	-	-		-	-	1	1	-	1	
CO5	Demonstrate more complex SQL queries.	1	1	1	-	-	-	-	-	-	-	-	1	2	1	2	
CO6	Implement, analyze and evaluate the project developed for an application..	-	2	2	1	-	1	1	-	1	-	2	-	1	-	1	

18CS61- SYSTEM SOFTWARE AND COMPILERS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Interpret the concepts of assemblers and Loaders	3	2	2	2	2	3	1	2	1	1	2	3	2	2	2	2
CO2	Comprehend the phases of compiler and build Lexical Analyzer	3	2	2	2	-	-	-	-	1		1	2	2	1	2	
CO3	Design and construct the parsers.	1	3	2	3	-	-	-	3	1	2	2	2	2	1	1	1
CO4	Apply lex and yacc tools for implementing Lexer and Parser	2	2	2	2	1	-	-	3	2	1	1	2	2	2	1	1
CO5	Construct Syntax Directed Translation and generate intermediate code.	-	1	-	3	-	-	1	3	-	-	-	3	-	-	2	1
CO6	Generate ASM code for a given intermediate code	2	2	2	2	1	1	1	3	1	-	-	-	-	-	-	-

18CS62-COMPUTER GRAPHICS & VISUALIZATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Discuss and demonstrate Computer Graphics applications, primitives and attributes using OpenGL.	2	1	2	1	2							1	2	2	2	
CO2	Illustrate geometric transformations and viewing on 2D objects.	2	2	2	1	3				1			2	2	2	2	
CO3	Examine concepts of clipping and geometric transformation on 3D objects.	2	3	3	2	3							2	2	2	2	
CO4	Infer properties of light and develop Illumination models.		1	1	1	3			1	1			1		2	3	
CO5	Analyze 3D Viewing and Visible Surface Detection			2	1	2				1			2	1		3	
CO6	Explore different representation of Programming event driven input and concepts of curved surfaces.	2	3	2	3	2				1			2	2		2	

18CS63- Web Technology and its Applications

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Realize HTML and CSS syntax and semantics to build web pages.	2	-	2	-	2	-	-	-	1	-	1	2	2	2	3	-
CO2	Construct and visually format tables and forms using HTML and CSS	2	-	2	-	2	-	-	-	1	-	1	2	2	2	2	-
CO3	Develop Client-Side Scripting and server side scripting using JavaScript and PHP	2	2	3	1	3	-	-	-	2	1	2	3	3	3	3	-
CO4	Appraise the principles of object oriented development using PHP	2	1	2	1	3	-	-	-	2	1	2	3	3	3	3	-
CO5	Examine state management features and optimizing web applications	2	1	3	1	3	-	-	-	2	2	2	3	3	2	3	2
CO6	Articulate the role of XML/JSON and Web Servicesin javascript and PHP	2	1	3	1	3	-	-	-	3	2	2	3	3	3	3	-

18CS641-DATA MINING AND DATA WAREHOUSING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Perceive data warehousing concepts and representation of multidimensional data models with their operations	2	2	-	-	3	-	-	-	-	-	-	2	-	2	2	-
CO2	Comprehend implementation of data warehouse	-	-	-	-	-	-	-	-	-	-	-	2	2	2	-	-
CO3	Assort data mining tasks and understand data proximity measures.	1	1	-	1	-	-	-	-	-	-	-	2	1	-	-	-
CO4	Interpret the association patterns among data and appraise association algorithms	1	2	1	2	1	2	-	-	-	-	-	2	1	2	2	-
CO5	Estimate various classification techniques	-	2	1	-	3	2	-	-	2	1	-	2	-	2	2	--

18CS643- CLOUD COMPUTING AND ITS APPLICATION

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Understand the concept of cloud computing, virtualization and classify services of cloud computing	3	3	2			3							3	3		
CO2	Illustrate architecture and programming in cloud		3		2												
CO3	Define the platforms for development of cloud applications and list the application of cloud	2		2								2			1		
CO4	Develop Server-Side Scripts using PHP Analyze various cloud programming models and apply them to solve problems on the cloud	2	2	3									2	2			
CO5	Comprehend the core issues of cloud computing such as security, privacy, and interoperability						3	1									
CO6	Explore the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc.		2	2								2			2	1	1

18CSL66-
SS LAB

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Demonstrate the working of Lexer.	3	1	3	2	3	-	-	-	-	-	-	1	-	-	1	-
CO2	Implement various parsing techniques.	3	3	3	2	3	-	-	-	-	-	1	1	2	1	2	-
CO3	Implement a code generator	3	3	3	2	1	-	-	-	-	-	1	1	3	1	3	-
CO4	Implement and analyze various CPU scheduling algorithms.	3	2	3	2	1	-	-	-	-	-	-	1	2	1	1	-
CO5	Implement resource allocation and deadlock avoidance algorithm.	3	2	3	2	1	-	-	-	-	-	-	1	1	1	1	-
CO6	Evaluate different algorithms required for management of page allocation techniques.	3	2	3	2	1	-	-	-	-	-	-	1	1	1	2	-

18CSL67-CG&V Lab WITH MINI PROJECT

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Implement Geometric primitives using OpenGL.	2	1	2	-	2	-	-	-	-	-	-	2	2	1	1	-
CO2	Apply 2D and 3D geometric transformations on objects.	2	2	3	2	2	-	-	-	-	-	-	2	2	2	1	-
CO3	Demonstrate viewing in real world scenarios using OpenGL	2	2	3	2	2	1	1	-	3	3	2	2	2	2	2	-
CO4	Visualization of clipping algorithms.	2	3	2	1	2	-	-	-	-	-	-	2	2	2	1	-
CO5	Apply different Programming event driven input	2	2	2	1	2	-	-	-	-	-	-	2	3	2	1	-
CO6	Transform 2D and 3D geometric objects.	3	3	2	1	2	-	-	-	2	-	-	2	2	2	1	

18CS72- Big Data Analytics

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Master the concepts of HDFS and MapReduce framework	2	1	1	2	1							1	1	1	1	
CO2	Investigate Hadoop related tools for Big Data Analytics and perform basic Hadoop Administration	1	2	2	2	1							1	1	1	2	
CO3	Recognize the role of Business Intelligence, Data warehousing and Visualization in decision making	1	1	1	1	1							1	1	1	2	
CO4	Infer the importance of core data mining techniques for data analytics	1	2	1	2	1							1	1	2	1	
CO5	Compare and Analyze different contrast different Text Mining Techniques	1	1	1	2	1							1	1	2	1	
CO6	Explore the applications of Social Networking and Web mining Techniques	1	2	2	2	1							1	1	1	1	

18CS734-UID

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Conceptualize the various user interfaces	1											1	1		1	
CO2	Summarize various concepts of web and business functions	1	2	1	1								1	1		1	
CO3	Make an analysis of the various types of menus	1	1										1	1		1	
CO4	Interpret the various windows, characteristics of windows and device based controls	1											1	1		1	
CO5	To analyze the various screen based controls	1											1	1		1	
CO6	To apply the various testing methods	1											1	1		1	

18CS743-NATURAL LANGUAGE PROCESSING

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	Understand the challenges and applications of NLP.	1		2										1		1	
CO2	Illustrate semantics and pragmatics of language for NLP.	2	2	2	2								1	2			2
CO3	Analyze the natural language text at word level and semantic level.	2	3	2	2								1	2			
CO4	Establish dependency path and annotate knowledge role.	2	3	2										2			1
CO5	Demonstrate techniques and tools used in Text mining.	2	2	2	2	1							2	1	2	1	
CO6	Explore various information retrieval techniques.	2	2	2	1								2	2		1	

18CSP77-PROJECT WORK PHASE 1

17CSP78	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Survey on various technological	3	3	2	1	-	-	-	-	1	-	2	-	1	-	2	-
CO2	Identify problem statement and objectives	2	2	2	1	-	-	-	-	-	-	-	-	1	-	2	-
CO3	Formulate different requirements, phases and functionalities	-	1	1	2	1	-	-	-	2	-	-	1	1	2	2	1
CO4	Design system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules	1	1	2	2	1	2	1	-	-	-	-	-	1	1	2	-
CO5	Build algorithms, code implementation, testing and validation	1	2	-	3	1	-	-	-	1	1	-	1	-	3	3	-
CO6	Prepare the project report	-	-	-	3	2	-	-	-	-	1	1	-	-	3	1	-

18CS81-INTERNET OF THINGS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Interpret the impact and challenges posed by IoT networks leading to new architectural models.	3	2	2	-	-	1	-	-	-	-	-	2	3	2	1	-
CO2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.	3	-	1	1	-	1	-	-	-	-	-	1	1	2	1	-
CO3	Appraise the role of IoT protocols for efficient network communication.	3	2	1	1	-	-	-	-	-	-	-	2	2	-	1	-
CO4	Elaborate the need for Data Analytics and Security in IoT.	2	1	1	-	1	-	-	1	-	-	-	2	2	2	1	1
CO5	Illustrate different sensor technologies for sensing real world entities	3	2	2	-	1	-	2	-	-	-	-	3	1	-	1	-
CO6	Explore the applications of IoT in Industry	2	1	1	-	1	-	1	-	-	-	-	2	1	2	1	-

18CS822- STORAGE AREA NETWORKS

	Course Outcomes	Program Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
CO1	**Examine the Storage Area Networks characteristics, components and storage architectures**	1											1	1		1	1
CO2	**Exemplify the concept of RAID and their suitability for different application environments**	1	2	1	1								1	1		1	1
CO3	**Depict the concepts of FC SAN, iSCSI, and FCIP**	1	1										1	1		1	1
CO4	**Analyze file sharing operations on NAS and IP-SAN of the different networks**	1											1	1		1	1
CO5	**Illustrate the concepts of business continuity and disaster recovery in a storage infrastructure**	1											1	1		1	1
CO6	**Demonstrate the Knowledge of Securing the local replication in Storage Infrastructure and Cloud**	1											1	1		1	1

18CS54-AUTOMATA THEORY & COMPUTABILITY

		Program Outcomes												Program Specific Outcomes			
	Course Outcomes	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation	3	3	3	2								2	3	1		-
CO2	Translate between different models of Computation	2	3	3	2								2	2	2		-
CO3	Design Grammars and Automata for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.	2	2	2	2			1					1	2	2	2	-
CO4	Apply rigorously formal mathematical methods to prove properties of languages, grammars and automata	2	2	2	2			1					1	2	2	2	
CO5	Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness.	2	1	1	3								2			2	
CO6	Classify a problem with respect to different models of Computation	2	1	1	1								2			2	

18CSP83 -PROJECT WORK PHASE 2

15CS85	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Continuation of project work implementation as suggested by review committee	1	2	-	3	1	-	-	-	1	1	-	1	-	3	3	-
CO2	Monitoring of project by project review committee.	2	2	2	1	-	-	-	-	-	-	-	-	1	-	2	-
CO3	Update different requirements, phases and functionalities	-	1	1	2	1	-	-	-	2	-	-	1	1	2	2	1
CO4	Design system architecture, DFD, Class diagrams, Sequence diagrams and Flow charts for different modules	1	1	2	2	1	2	1	-	-	-	-	-	1	1	2	-
CO5	Build algorithms, code implementation, testing and validation	1	2	-	3	1	-	-	-	1	1	-	1	-	3	3	-
CO6	Prepare the project work 2 report	-	-	-	3	2	-	-	-	-	1	1	-	-	3	1	-

18CSI85-INTERNSHIP

18CSI85	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	Gain Knowledge on various technological domains in real time	3	3	2	1	-	-	-	-	1	-	2	-	1	-	2	-
CO2	Learn and develop specific skillset for implementing project.	2	2	2	1	-	-	-	-	-	-	-	-	1	-	2	-
CO3	Organize/plan of project design and develop in specific stipulated time	-	1	1	2	1	-	-	-	2	-	-	1	1	2	2	1
CO4	Prepare the detailed internship project work report	1	1	2	2	1	2	1	-	-	-	-	-	1	1	2	-
CO5	Build a record of work experience from internship work	1	2	-	3	1	-	-	-	1	1	-	1	-	3	3	-
CO6	Search and apply for a job after the course completion	-	-	-	3	2	-	-	-	-	1	1	-	-	3	1	-

III SEMESTER

Course Code	ENGINEERING MATHEMATICS (15MAT31)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO2	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO3	2	3	-	-	1	1	-	-	-	1	-	-	-	-	-
CO4	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO5	2	2	-	-	-	1	-	-	-	1	-	-	-	-	-
CO6															

Course Code	STRENGTH OF MATERIALS(15CV32)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	1	3	-	-	-	-	-	-	1	-	-	3
CO2	3	2	-	1	-	-	-	-	-	-	-	-	-	-	-
CO3	3	3	-	1	-	-	-	-	-	-	-	2	1	-	-
CO4	3	2	-	1	-	-	-	-	-	-	-	2	1	-	-
CO5	3	3	-	1	3	-	-	-	-	-	-	1	1	-	3
CO6															

Course Code	Fluid Mechanics(15CV33)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	-	-	-	1	-	-	-	-	1	-	-	1
CO2	3	3	2	1	-	1	1	-	-	-	-	1	-	-	1
CO3	3	3	3	1	2	2	1	-	-	-	-	1	-	-	2
CO4	3	3	3	1	2	2	1	-	1	-	-	1	1	-	2
CO5	3	3	2	1	2	2	1	-	1	-	-	1	1	-	2
CO6															

Course Code	Basic Surveying(15CV34)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO2	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO3	2	3	-	-	1	1	-	-	-	1	-	-	-	-	-
CO4	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO5	2	2	-	-	-	1	-	-	-	1	-	-	-	-	-
CO6															

Course Code	Engineering Geology(15CV35)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	-	2	2	1	-	-	-	2	-	-	2
CO2	2	-	2	1	-	2	2	2	-	-	-	2	-	-	3
CO3	3	2	2	2	-	2	2	1	-	-	-	2	-	-	2
CO4	3	2	2	2	-	2	2	2	-	-	-	2	-	-	2
CO5	1	2	1	2	-	2	3	2	3	-	-	2	-	-	3
CO6															

Course Code	Building Materials and Construction(15CV36)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	1	1	1	-	-	-	-	2	-	2	-
CO2	2	-	-	-	1	1	1	-	-	-	-	2	-	2	-
CO3	2	-	-	-	1	1	1	-	-	-	-	2	-	2	-
CO4	3	2	3	-	1	1	1	-	-	-	-	2	-	2	-
CO5	2	-	-	-	1	1	1	-	-	-	-	2	-	2	-
CO6															

Course Code	Building Materials Testing Laboratory(15CVL37)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	2	3	2	-	-	3	-	-	-	2	3	3
CO2	3	3	-	2	3	2	-	-	3	-	-	-	2	3	3
CO3	2	-	-	-	3	-	-	-	-	-	-	-	1	-	1
CO4	3	2	-	2	1	3	-	-	3	-	-	-	1	-	3
CO5	3	2	-	2	3	-	-	3	3	3	-	-	1	2	3
CO6															

Course Code	Basic Surveying Practice(15CVL38)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	1	3	2	1	1	3	2	-	2	2	2	2
CO2	3	3	2	1	3	2	1	1	3	2	-	2	2	2	2
CO3	3	3	2	1	3	2	1	1	3	2	-	2	2	2	2
CO4	3	3	2	1	3	2	1	1	3	2	-	2	2	2	2
CO5	3	3	2	1	3	2	1	1	3	2	-	2	2	2	2
CO6															

IV SEMESTER

Course Code	ENGINEERING MATHEMATICS(15MAT41)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO2	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO3	2	3	-	-	1	1	-	-	-	1	-	-	-	-	-
CO4	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO5	2	2	-	-	-	1	-	-	-	1	-	-	-	-	-
CO6															

Course Code	Analysis of Determinate Structures(15CV42)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1										2		
CO2	3	2	1										2		
CO3	3	2	1										2		
CO4	3	2	2										2		
CO5	3	2	2										2		
CO6															

Course Code	Applied Hydraulics(15CV43)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	-	-	-	-	-	-	-	-	2	2	-	2
CO2	3	3	3	-	-	2	1	-	-	-	-	2	2	-	-
CO3	3	3	-	-	-	1	-	-	-	-	-	2	2	-	-
CO4	3	3	3	-	-	-	-	-	-	-	-	2	2	-	2
CO5	3	3	3	-	-	-	-	-	-	-	-	2	2	-	2
CO6															

Course Code	Concrete Technology(15CV44)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	0		1						1	1	1	1
CO2	2	1	1	0		1						1	1	1	1
CO3	2	1	1	0		1						1	1	1	1
CO4	2	1	2	2	1	1	1					2	2	1	1
CO5	2	1	1	0		1						1	1	1	1
CO6															

Course Code	Basic Geotechnical Engineering(15CV45)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2		3												
CO2	3		2	1										2	
CO3	3		3	1	1										
CO4	3	2	3	2	1										
CO5	3		2	1										2	
CO6															

Course Code	Advanced Surveying(15CV46)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	-	-	1	-	-	-	-	-	2	1	-	1
CO2	3	3	1	-	-	-	-	-	-	-	-	2	3	-	2
CO3	3	2	3	1	1	1	-	-	-	-	-	2	3	-	2
CO4	3	2	1	2	1	-	-	-	-	-	-	2	2	-	2
CO5	3	1	1	1	3	1	-	1	1	-	-	2	2	-	1
CO6															

Course Code	Fluid Mechanics Laboratory(15CVL47)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	3	2	-	2	-	3	-	-	1	-	-	3
CO2	3	3	-	3	2	-	2	-	3	-	-	1	-	-	3
CO3	3	3	-	3	2	-	2	-	3	-	-	1	-	-	3
CO4	3	3	-	3	2	-	2	-	3	-	-	1	-	-	3
CO5	3	3	-	3	2	-	2	-	3	-	-	1	-	-	3
CO6															

Course Code	Engineering Geology Laboratory(15CVL48)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	3	1	2	2	-	-	-	-	2	-	-	-
CO2	3	3	3	-	-	2	2	-	-	-	-	2	-	-	-
CO3	3	3	3	-	-	-	2	-	-	-	-	2	-	-	-
CO4	3	3	1	1	1	-	2	-	2	-	-	2	-	-	1
CO5	3	2	1	2	2	1	3	-	3	-	-	2	-	-	3
CO6															

V SEMESTER

Course Code	Design of RC Structural Elements(15CV51)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	1	-	-	-	2	2	-	-	1	2	1	1
CO2	3	3	3	2	-	-	-	2	1	-	-	2	3	2	1
CO3	3	3	3	2	-	-	-	2	1	-	-	2	3	2	1
CO4	3	3	3	2	-	-	-	2	1	-	-	2	3	2	1
CO5	3	3	3	2	-	-	-	2	1	-	-	2	3	2	1
CO6															

Course Code	Analysis of Indeterminate Structures(15CV52)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1										1		
CO2	3	3	1										2		
CO3	3	3	1										2		
CO4	3	3	2										3		
CO5	3	3	2										3		
CO6															

Course Code	Applied Geotechnical Engineering(15CV53)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3											1		
CO2	2	3											2		
CO3	2	3											2		
CO4	2	3											2		
CO5	2	3											2		
CO6															

Course Code	Computer Aided Building Planning and Drawing(15CV54)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	-	-	3	2	-	1	1	1	-	2	2	-	2
CO2	3	1	-	-	3	2	-	1	1	1	-	2	2	-	2
CO3	3	1	-	-	3	2	-	1	1	1	-	2	2	-	2
CO4	3	1	-	-	3	2	-	1	1	1	-	2	2	-	2
CO5	3	1	-	-	3	2	-	1	1	1	-	2	2	-	2
CO6															

Course Code	AIR POLLUTION(15CV551)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	-	-	2	3	1	-	-	-	1	2	-	-
CO2	3	2	2	-	-	2	1	-	-	-	-	1	2	-	-
CO3	3	2	2	-	-	2	1	-	-	-	-	1	2	-	-
CO4	3	2	2	-	-	2	1	-	-	-	-	1	2	-	-
CO5	1	2	2	-	-	3	3	-	-	-	3	1	2	-	-
CO6															

Course Code	TRAFFIC ENGINEERING(15CV561)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	2	-	1	1	-	-	-	-	-	2	-	-	1
CO2	3	2	-	1	-	-	-	-	-	-	-	2	-	-	2
CO3	3	2	3	1	1	1	-	-	-	-	-	1	1	-	2
CO4	3	2	-	2	1	2	2	1	-	-	-	1	-	-	3
CO5	3	1	-	1	3	-	-	-	-	-	-	1	-	-	2
CO6															

Course Code	Geotechnical Engineering Laboratory(15CV57)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	1		2							2	2	1
CO2	2	2	2	2		2							2	2	1
CO3	2	1	2	3		1							1	3	3
CO4	2	2	2	2		2							1	2	1
CO5	1	1	1	1		1							1	1	1

VI SEMESTER

Course Code	Construction Management and Entrepreneurship(15CV61)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	2	2	2	2	2	-	-	2	2	-	2
CO2	3	-	-	-	-	3	2	3	2	-	-	2	-	-	-
CO3	3	-	-	-	1	3	1	3	1	-	-	2	-	-	-
CO4	3	-	-	-	1	2	1	1	1	-	-	2	-	-	1
CO5	3	-	-	-	1	3	-	3	3	-	-	2	-	-	1
CO6															

Course Code	Design of steel structural elements(15CV62)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	1		1		2				2	2		1
CO2	3	2	3	1		1		2				2	2		1
CO3	3	2	3	1		1		2				2	2		1
CO4	3	2	3	1		1		2				2	2		1
CO5	3	2	3	1		1		2				2	2		1
CO6															

Course Code	Highway Engineering(15CV63)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	2	-	-	1	-	-	-	-	-	2	-	-	-
CO2	3	3	3	2	1	2	-	-	-	-	-	2	-	-	-
CO3	3	3	3	2	1	1	1	-	-	-	-	2	2	2	3
CO4	1	2	3	1	1	2	1	-	-	-	-	2	2	3	3
CO5	3	3	2	1	1	1	2	-	-	-	-	2	-	1	-
CO6															

Course Code	Water Supply and Treatment Engineering(15CV64)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	2	3	-	2	-	2	-	1	-	2	2	-	1
CO2	3	3	1	3	1	3	1	2	-	-	-	2	3	-	3
CO3	2	2	3	1	-	2	1	-	-	-	-	3	3	1	1
CO4	3	2	3	2	-	2	-	3	-	-	1	2	1	2	1
CO5	3	3	3	2	-	2	1	1	-	-	-	3	3	2	2
CO6															

Course Code	MATRIX METHOD OF STRUCTURAL ANALYSIS (15CV652)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1										1		1
CO2	2	3	1										1		2
CO3	2	3	1										1		2
CO4	2	3	1										1		1
CO5	2	3	1										1		2
CO6															

Course Code	ABM (15CV653)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	2	1	2	1
CO2	3	1	2	1	1	1	1	-	-	-	-	2	1	2	1
CO3	3	-	-	-	2	1	1	-	-	-	-	2	1	2	1
CO4	3	-	-	2	-	-	-	-	-	-	-	2	1	2	1
CO5	3	-	-	1	3	-	2	-	-	-	-	2	1	2	1
CO6															

Course Code	GROUND IMPROVEMENT TECHNIQUES(15CV654)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3		2	2		2	2					2	2		
CO2	3		2	2		2	2					2	2		
CO3	3		2	2		2	2					2	2		
CO4	3		2	2		2	3					2	2		
CO5	3		2	2		2	2					2	2		
CO6															

CO6															
Course Code	Concrete and Highway Materials Laboratory(15CVL58)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	-	1	1	-	3	-	2	-	-	2	-	-	3
CO2	3	1	-	1	1	-	3	-	2	-	-	2	-	-	3
CO3	3	1	2	2	1	-	3	-	2	-	-	3	2	-	3
CO4	3	1	-	1	1	-	3	-	2	-	-	2	-	-	3
CO5	3	1	-	1	1	-	3	-	2	-	-	2	-	-	3
CO6															

VII SEMESTER

Course Code	MUNICIPAL AND INDUSTRIAL WASTE WATER ENGINEERING(15CV71)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	-	-	2	3	1	-	-	-	1	1	2	1
CO2	3	2	2	3	-	1	2	-	-	-	-	2	1	-	3
CO3	3	2	2	-	3	3	2	-	-	-	-	3	3	2	1
CO4	3	2	3	2	-	2	3	2	-	-	-	3	3	2	3
CO5	3	3	3	3	-	2	3	2	-	-	1	3	3	2	3
CO6															
Course Code	DESIGN OF RCC AND STEEL STRUCTURES(15CV72)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	-	-	-	-	-	-	-	2	2	-	3
CO2	3	3	3	3	-	-	-	-	1	-	-	2	3	-	3
CO3	3	3	3	2	-	1	-	-	1	-	-	2	3	-	3
CO4	3	3	3	2		-	-	-	-	-	-	2	3	-	3
CO5	3	3	3	2	-	-	-	-	1	-	-	2	3	-	2
CO6															
Course Code	HYDROLOGY AND IRRIGATION ENGINEERING(15CV73)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	-	-	-	-	-	-	1	2	-	2
CO2	3	2	1	1	1	-	-	-	-	-	-	1	2	-	1
CO3	3	2	1	2	-	-	1	1	-	-	-	1	2	-	2
CO4	3	3	2	2	-	1	2	-	-	-	-	1	2	-	2
CO5	3	2	3	1	-	1	1	1	1	-	-	2	3	-	2
CO6															
Course Code	DESIGN OF BRIDGES(15CV741)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3												1		
CO2	2		3	3									2		
CO3	2		3	3									2		
CO4	2			3									2		
CO5	2		3	3									2		
CO6															
Course Code	REINFORCED EARTH STRUCTURES (15CV754)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3			2		2	1						2		1
CO2		3	2				2						2		
CO3		3	2				2						2		
CO4		3	2	1									1		
CO5		3	2				2						2		
CO6															
Course Code	ENVIRONMENTAL ENGINEERING LABORATORY(15CVL76)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3		3	3		-	1	2	-	-	2	1	-	1
CO2	2	3	2	-	-	2	-	1	-	-	-	2	1	-	2
CO3	2	2	3	1	-	2	1	-	-	-	-	3	3	1	2
CO4	3	3	3	2	-	2	1	-	3	1	-	1	1	-	1
CO5	2	2	3	1	-	2	1	-	-	-	-	3	3	1	2
CO6															
Course Code	COMPUTER AIDED DETAILING OF STRUCTURES(15CVL77)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	1		1		2				2	2		1
CO2	3	2	3	1		1		2				2	2		1
CO3	3	2	3	1		1		2				2	2		1
CO4	3	2	3	1		1		2				2	2		1
CO5	3	2	3	1		1		2				2	2		1
CO6															

CO6															
Course Code	FINITE ELEMENT ANALYSIS(15CV664)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3					1		2					3		
CO2	3		3	2		1		2					2		
CO3	3		3	3		1		2						3	
CO4	3		3			1		2						3	
CO5	3		2	1		1		2				1		2	1
CO6															
Course Code	Software Application Lab(15CV667)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2		1	2	-	-	1	-	1	-	2	2	-	2
CO2	3	2		1	2	-	-	1	-	1	-	2	2	-	2
CO3	3	2		1	2	-	-	1	-	1	-	2	2	2	2
CO4	3	2		1	2	-	-	1	-	1	-	2	2	-	2
CO5	3	2		1	2	-	-	1	-	1	-	2	2	-	2
CO6															
Course Code	Extensive Survey Project /Camp(15CVP68)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	1	1	1	1	3	1	2	1	3	2	3
CO2	3	3	3	3	1	1	1	1	3	1	2	1	3	2	3
CO3	3	3	3	3	1	1	1	1	3	1	2	1	3	2	3
CO4	3	3	3	3	1	1	1	1	3	1	2	1	3	2	3
CO5	3	3	3	3	1	1	1	1	3	1	2	1	3	2	3
CO6															

VIII SEMESTER

Course Code	QUANTITY SURVEYING AND CONTRACTS MANAGEMENT(15CV81)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2					2			1			1	2	3	
CO2	2					1			1			1	2	3	
CO3	1					2						1	2	3	
CO4	2					1						1	2	3	
CO5						1					3	1	2	2	
CO6															
Course Code	DESIGN OF PRESTRESSED CONCRETE ELEMENTS(15CV82)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	1		1		2				2	2		1
CO2	3	2	3	1		1		2				2	2		1
CO3	3	2	3	1		1		2				2	2		1
CO4	3	2	3	1		1		2				2	2		1
CO5	3	2	3	1		1		2				2	2		1
CO6															
Course Code	EARTHQUAKE RESISTANT DESIGN OF STRUCTURES(15CV831)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2		1						3	2	2	
CO2	3	3	3	2		1						3	2	2	
CO3	3	3	2	2		1						3	1	2	
CO4	3	3	3	2		1						3	2	2	
CO5	3	3	3	2		1						3	2	2	
CO6															
Course Code	PAVEMENT DESIGN(15CV833)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	1	-	-	-	-	-	-	-	3	3	-	-
CO2	3	3	3	1	-	-	-	-	-	-	-	3	3	-	-
CO3	2	3	1	2	2	2	-	-	-	-	-	-	-	-	3
CO4	3	3	3	-	-	-	-	-	-	-	-	3	3	-	-
CO5	2	2	3	2	2	2	-	-	-	-	-	2	-	-	3
CO6															

Course Code	17 MAT 31
Course Title	TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES
CO1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering.
CO2	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.
CO3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems
CO4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods
CO5	Determine the externals of functional using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.
Course Code	15 CV 32
Course Title	STRENGTH OF MATERIALS
	This course will enable students to;
CO1	Determine stresses and strains for different materials and understand strength of structural elements
CO2	Interpret and Evaluate internal forces developed and resistance mechanism for one dimensional and two dimensional structural elements under the action of compound stresses
CO3	Evaluate and Develop shear force and bending moment variations on different beams.
CO4	Analyse internal forces and stresses induced on structural elements and evaluate the behaviour of columns and struts.
CO5	Assess the behavior of torsional members and understand different failure theories.
Course Code	15 CV 33
Course Title	Fluid Mechanics

	This course will enable students to;
CO1	Explain the importance, application and inter relationship of various properties of fluids.
CO2	Evaluate hydrostatic forces and its application to practical problem solutions.
CO3	Apply the principles of kinematics and hydrodynamics for practical application.
CO4	Analyze and design of pipes and pipe networks for various pressure and losses.
CO5	Estimate the discharge using various flow measuring devices.
Course Code	15 CV 34
Course Title	Basic Surveying
CO1	1. To understand the fundamental principles of Geodetics and linear measurement of vertical and horizontal plane.
CO2	2. To Measure angular dimensions in both horizontal and vertical plane to arrive at solutions to basic surveying problems.
CO3	3. To obtain and analyse geo-spatial data to appropriate engineering problems by using modern instruments.
CO4	4. To measure geodetic data and evaluate difference in elevation by using Levelling instruments and different techniques.
CO5	5. Analyse the obtained spatial data and compute areas and volumes. Represent 3D data on plane figures as contours
Course Code	15 CV 35
Course Title	Engineering Geology
	This course will enable students to;
CO1	To understand the internal structure and composition of the earth.
CO2	To comprehend the properties, occurrence and uses of minerals in various industries.
CO3	To understand about geo-morphological agents such as river, wind, sea waves, and their

	implications in implementing civil engineering projects.
CO4	To perceive knowledge about the structures of the rocks and their considerations in the selection of site for dams, tunnels, bridges and highways.
CO5	To learn the application of Topographic maps, remote sensing and GIS in Civil engineering practices and natural resource management.
Course Code	15 CV 36
Course Title	BUILDING MATERIALS AND CONSTRUCTION
	This course will enable students to;
CO1	Utilize suitable materials for buildings and select type of test to examine their properties.
CO2	Select different type of foundation for different soil type and Classification of Masonry.
CO3	Understand the concepts of lintels, arches,floors and roofs related to its construction and comprision inbetween.
CO4	Obtain and apply essential knowledge for geometrical design of stairs and select doors, windows, ventilators and formwork as per standard recommendation.
CO5	Explain the concept of formwork, shoring and underpinning and know the importance of damp proofing.
Course Code	15 CVL 38
Course Title	BASIC SURVEYING PRACTICE
CO1	1. To Apply the basic principles of engineering surveying for linear measurements and setting out the experiments by Direct and Indirect method.
CO2	2. To Measure angular dimensions and setting out the geomertical figures in horizontal Plane by using compass.
CO3	3. To measure geodetic data, evaluate difference in elevation and plotting of Profile by using Levelling instruments and different field procedures.
CO4	4. To Measure Linear and angular dimensions in both horizontal and vertical plane by using theodolite with different field procedures.

CO5	5. To understand the working of Minor instruments Clinometer, Ceylon Ghat tracer, Box sextant, Hand level, Planimeter, nautical sextant and Pentagraph.
Course Code	15 CVL 37
Course Title	BUILDING MATERIALS TESTING LABORATORY
CO1	Reproduce the basic knowledge of mathematics and engineering in finding the strength in tension,compression, shear and torsion.
CO2	Identify, formulate and solve engineering problems of structural elements subjected to flexure.
CO3	Ability to use the techniques, skills and modern engineering tools necessary for engineering.
CO4	Evaluate the impact of engineering solutions on the society and also will be aware of contemporary issues regarding failure of structures due to unsuitable materials.
CO5	Ability to communicate effectively the mechanical properties of materials.
Course Code	15 MAT 41
Course Title	COMPLEX ANALYSIS, PROBABILITY AND STATISTICAL METHODS
CO1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
CO2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
CO3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
CO4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
CO5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.
Course Code	15 CV 42
Course Title	ANALYSIS OF DETERMINATE STRUCTURES

	This course will enable students to;
CO1	Solve the static & kinematic indeterminacies for beams, frames & trusses and Evaluate the forces in determinate trusses by method of joints and sections.
CO2	Evaluate the deflection of the cantilever, simply supported and overhanging beams by Double integration and Macaulay's method and to Determine the non-prismatic beams by Moment area and Conjugate beam methods
CO3	Understand the energy principles & energy theorems & its applications to Determine the deflections of beams, trusses and bent frames by strain energy, castigliano's theorem and unit load methods
CO4	Determine the stress resultants in three hinged arches and to Evaluate the stress resultants in cables for different loading conditions.
CO5	Understand the concept of influence lines for beams and Construct the ILD diagram for the moving loads.
Course Code	15 CV 43
Course Title	APPLIED HYDRAULICS
	This course will enable students to;
CO1	analyse the stability of floating and submerged bodies. (PO1-H, PO2-H,PO12- M, PSO1- M, PSO3-M)
CO2	Design open channels of various cross sections including economical channel sections (PO1-H, PO2-H,PO3-H, PO7- L, PO12- M, PSO1- M)
CO3	Apply Energy concepts to flow in open channel sections,Compute water surface profiles at different flow conditions (PO1-H, PO2-H,PO3-L,PO6- L, PSO1- M)
CO4	Understand impact of jets on stationary ans moving vanes,analyse the performance and design components of impulse turbines (PO1-H, PO2-H,PO3-H,PO12- M, PSO1- L, PSO3-L)
CO5	Design radial flow reaction turbines and centrifugal pump for the given data and apply their operation characteristics under different operating conditions and analyze performance (PO1-H, PO2-M,PO3-H,PO12- M, PSO1- L, PSO3-M)
Course Code	15 CV 44
Course Title	CONCRETE TECHNOLOGY

	This course will enable students to;
CO1	Identify the properties and role of constituents of concrete
CO2	list out the properties of fresh concrete and Apply fundamental knowledge of properties of fresh concrete in design mix of concrete and also study the effect of admixtures on fresh concrete
CO3	Obtain and apply essential knowledge of hardened properties of concrete and also study about non destructing tests in evaluating the strength of concrete
CO4	Design a concrete mix which accomplishes the required properties for fresh and hardened concrete.
CO5	Choose waste materials as alternative and innovative materials for use in concrete.
Course Code	15 CV 45
Course Title	BASIC GEOTECHNICAL ENGINEERING
CO1	Will acquire an understanding of the procedures to determine index properties of any type of soil, classify the soil based on its index properties
CO2	Will be able to determine compaction characteristics of soil and apply that knowledge to assess field compaction procedures
CO3	Will be able to determine permeability property of soils and acquires conceptual knowledge about stresses due to seepage and effective stress; Also acquire ability to estimate seepage losses across hydraulic structure
CO4	Ability to solve practical problems related to estimation of consolidation settlement of soil deposits also time required for the same
CO5	Will be able to estimate shear strength parameters of different types of soils using the data of different shear tests and comprehend Mohr-Coulomb failure theory.
Course Code	15 CV 46
Course Title	ADVANCED SURVEYING

CO1	Apply geometric principles to arrive at solutions to surveying problems.
CO2	Analyze spatial data using appropriate computational and analytical techniques.
CO3	Design proper types of curves for deviating type of alignments.
CO4	Use the concepts of advanced data capturing methods necessary for engineering practice
CO5	To learn various advanced equipments being used in the total survey and applications in GIS
Course Code	15 CVL 47
Course Title	Surveying Practice-II Laboratory
	This course will enable students to;
CO1	1. To measure Linear dimensios in both horizontal and vertical plane by using theodolite with different field procedures.
CO2	2. To measure angular dimensions in both horizontal and vertical plane by using theodolite with different field procedures.
CO3	3. To Design and set out proper types of curves for deviating type of alignments.
CO4	4. To set out the centre lines of structural elements.
CO5	5. To understand the working of Total Station. Traversing, Longitudinal sections, Block levelling, Usage of relevant softwares for preparation of the contour drawings.
Course Code	15 CVL 48
Course Title	Engineering Geology Laboratory
	This course will enable students to;
CO1	To identify the minerals and rocks based on their inherent properties and uses in civil engineering
CO2	To interpret the geological maps related to civil engineering projects.
CO3	To learn the dip and strike, borehole problems, thickness of geological formation related to foundation, tunnels, reservoirs and mining.
CO4	To understand subsurface geological conditions through a geophysical techniques and

	watershed management
CO5	To visit the civil engineering projects like dams, reservoirs, tunnels, quarry sites etc.
Course Code	15 CV 51
Course Title	DESIGN OF RC STRUCTURAL ELEMENTS
CO1	Understand the Design philosophy ,principles and deflection failure on RC members.
CO2	Analyse engineering Problems of RC elements subjected to flexure, shear and torsion as for relavent codes.
CO3	Design of beams for shear, combined bending and torsion as for relavent codes.
CO4	Demonstrate the Procedural knowledge in Designs of RC structural elements such as slabs and stairs as for relavent codes.
CO5	Design the columns and footings subjected to axial load, uni-axial and bi-axial moments as for relavent codes.
Course Code	15 CV 52
Course Title	ANALYSIS OF INDETERMINATE STRUCTURES
	This course will enable students to;
CO1	Determine the moment in indeterminate beams and frames of no sway and sway, having variable moment of inertia and subsidence using the slope deflection method and Construct the BMD
CO2	Determine the moment in indeterminate beams and frames of no sway and sway using the moment distribution method and Construct the BMD
CO3	Determine the moments and Construct the bending moment diagram for continuous beams and frames by Kani's method.
CO4	Construct the bending moment diagram for beams and frames using flexibility method and Analyze the indeterminate plane trusses by system approach
CO5	Analyze the continuous beams, frames and plane trusses by system stiffness method and Construct bending moment diagram for beams & frames.

Course Code	15 CV 53
Course Title	APPLIED GEOTECHNICAL ENGINEERING
CO1	Ability to plan and execute geotechnical site investigation program for different civil engineering projects
CO2	Understanding of stress distribution and resulting settlement beneath the loaded footings on sand and clayey soils
CO3	Ability to estimate factor of safety against failure of slopes and to compute lateral pressure distribution behind earth retaining structures
CO4	Ability to determine bearing capacity of soil and achieve proficiency in proportioning shallow isolated and combined footings for uniform bearing pressure
CO5	Capable of estimating load carrying capacity of single and group of piles
Course Code	15 CV 54
Course Title	Computer Aided Building Planning and Drawing
	This course will enable students to;
CO1	Gain a broad understanding of planning and designing of buildings
CO2	Prepare, read and interpret the structural element drawings in a professional set up.
CO3	Prepare, read and interpret the cross section of pavement, septic tank, rainwater harvesting, etc... drawings in a professional set up.
CO4	Know the procedures of submission of drawings and Develop working and submission drawings for building plan & sectional elevation
CO5	Plan and design a residential or public building as per the given requirements
Course Code	15 CV 551
Course Title	Air Pollution and Control
	This course will enable students to;

CO1	Identify the major sources of air pollution and asses their effects on health and environment (PO1-M,PO6-H, PO7-L,PO12-L, PSO3-M)
CO2	Evaluate the dispersion of air pollutants in the atmosphere and understand air quality monitoring models. (PO1-L, PO2-M,PO3-M,PO6-M, PO7-L,PO12-L, PSO1-M)
CO3	Ascertain sampling techniques for atmospheric and stack pollutants for different indoor and outdoor pollutants. (PO1-L, PO2-M,PO6-M,PO12-L, PSO1-M)
CO4	Choose and design control techniques for particulate and gaseous emissions. (PO1-M, PO2-H,PO3-H,PO6-H, PO7-L,PO12-L, PSO1-M)
CO5	Identify automobile pollutants, global environmental concerns and create awareness through Environmental Protection acts (PO1-L, PO2-M,PO6-H, PO7-H,PO10- H,PO12-L, PSO1-M)
Course Code	15 CV 561
Course Title	Traffic Engineering
CO1	Understand the human factors and vehicular factors in traffic engineering design.
CO2	Conduct different types of traffic surveys and analysis of collected data using statistical concepts.
CO3	Use an appropriate traffic flow theory and to comprehend the capacity & signalized intersection analysis.
CO4	Understand the cocepts of traffic safety and environment.
CO5	Understand the basic knowledge of Intelligent Transportation System.
Course Code	15 CVL 57
Course Title	GEOTECHNICAL ENGINEERING LAB
CO1	Physical and index properties of the soil
CO2	Classify based on index properties and field identification

CO3	To determine OMC and MDD, plan and assess field compaction program
CO4	Shear strength and consolidation parameters to assess strength and deformation characteristics
CO5	In-situ shear strength characteristics (SPT- Demonstration)
Course Code	17 MEL57
Course Title	15CVL58
	Concrete and Highway Materials lab.
CO1	
CO2	Conduct appropriate laboratory experiments and interpret the results
CO3	Determine the quality and suitability of cement
CO4	Design appropriate concrete mix
CO5	Determine strength and quality of concrete
Course Code	15 CV 61
Course Title	Construction Management and Entrepreneurship
	This course will enable students to;
CO1	Understand the construction management process.
CO2	Understand and solve variety of issues that are encountered during resource management.
CO3	Adapt the professional obligations effectively with global outlook
CO4	Build the knowledge engineering economics.
CO5	Understand the concept of entrepreneurship.
Course Code	15 CV 62
Course Title	DESIGN OF STEEL STRUCTURAL ELEMENTS
	Students will be able to:

CO1	1. Understand fundamentals of Steel structures as per relevant codal provisions and Analyse Plastic behaviour of structural steel.
CO2	2. Analyse and Design Bolted and Welded connections in steel structures as per codal provisions
CO3	3. Design Compression member and column Lacings & battens in steel structures as per codal provisions
CO4	4. Design Tension member and Column bases in steel structures as per codal provisions
CO5	5. Design of Steel Beams as per codal provisions
Course Code	15 CV 63
Course Title	Highway Engineering
CO1	Understand basic concepts of transportation engineering, planing to fit best alignment mong alternate proposals
CO2	Design road geometrics, structural components of pavement and drainage. Understand the Concept of capability of proposing a new alignment or re-alignment of existing roads.
CO3	Evaluate the engineering properties of the materials and suggest the suitability of the same for pavement construction, Design ESWL concept
CO4	Design blending of different materials used in bituminous mix, Understand the concpt of construction of different type of pavement
CO5	Evaluate the highway economics by few select methods and also Understand a basic knowledge of various highway financing concepts.
Course Code	15 CV 64
Course Title	
	This course will enable students to;
CO1	Make use of different standards of water demand in population forecasting and design average or peak water demand for an area/community.
CO2	Evaluate available sources of water, quantitatively and qualitatively and assess the water quality, environmental significance of various characteristics of water sample as per BIS

	standards
CO3	Acquire the knowledge to decide on levels of treating water and design primary and secondary treatment units along with the advancements in it.
CO4	Identify and categorize hardness in water and suggest conventional or advanced techniques of treatment for hardness removal and also will acquire the knowledge in disinfecting water.
CO5	Design a comprehensive water treatment plant and distribution system in regard to pipes,materials and pumps on the basis of field visit.
Course Code	15 CV 652
Course Title	MATRIX METHOD OF STRUCTURAL ANALYSIS
	This course will enable students to;
CO1	Evaluate the structural systems to develop flexibility and stiffness matrices for simple problems.
CO2	Identify, formulate and solve engineering problems with respect to flexibility matrices as applied to continuous beams, rigid frames and trusses.
CO3	Identify, formulate and solve engineering problems with respect to stiffness matrices as applied to continuous beams, rigid frames and trusses.
CO4	Understand and Analyze solving problems involving temperature changes and lack of fit.
CO5	Identify, formulate and solve engineering problems by application of concepts of direct stiffness method as applied to continuous beams and trusses.
Course Code	15 CV 653
Course Title	Alternative Building Materials
	This course will enable students to;
CO1	Solve the problems of Environmental issues concerned to building materials and cost effective building technologies;
CO2	Choose appropriate type of masonry unit and mortar for civil engineering constructions; also they are able to Design Structural Masonry Elements under Axial Compression.
CO3	Analyse different alternative building materials, Also capable of choose suitable agro and

	industrial wastes as a building material.
CO4	Apply alternatives for wall constructions, Ferro cement, ferroconcrete, masonry vaults and domes using IS specifications.
CO5	Identify the different equipment for production of alernative materials.
Course Code	15 CV 661
Course Title	Water Resource Management
	This course will enable students to;
CO1	Illustrate the potential of groundwater and surface water resources.
CO2	Explain the issues related to planning and management of water resources.
CO3	Propose IWRM in different regions.
CO4	Explain legal issues of water policy.
CO5	Select the method for water harvesting based on the area.
Course Code	15CV664
Course Title	FINITE ELEMENT ANALYSIS
CO1	Understand the concepts of elasticity finite element analysis.
CO2	Achieve Knowledge of discretizing a structural body and use of shape functions for one dimensional elements.
CO3	Understand use of shape functions for two dimensional elements.
CO4	Achieve Knowledge of iso parametric concepts and application of numerical integration for simple 1D, 2D and 3D problems.
CO5	Gain knowledge on Techniques to solve nonlinearities in structural systems and computer programs for FEM.
Course Code	15CVL67

Course Title	SOFTWARE APPLICATION LAB
	This course will enable students to;
CO1	Able to apply the knowledge of softwares for analysis of trusses, continuous beams and portal frames.
CO2	Analyse the multi storied frame structure.
CO3	Understand the basic features of project management software.
CO4	Able to create decision maps using GIS.
CO5	Make use of EXCEL for preparing spresd sheets for various civil engineering works.
Course Code	15CVL68
Course Title	EXTENSIVE SURVEY PROJECT /CAMP
	This course will enable students to;
CO1	Apply surveying knowledge,to do team work for a detailed survey required for project execution and Create detailed drawing for the NEW TANK PROJECT.
CO2	Identify sources of water by basic tools and Apply different methods for calculation of quantity of water to carry out Survey work and Create detailed drawing for the WATER SUPPLY AND SANITARY PROJECT
CO3	Apply surveying knowledge, basic tools & team work for preliminary and detailed investigations to align a new road and to Create detailed drawing for the HIGHWAY PROJECT
CO4	Plan and Redesign using basic survey tools and to Create detailed drawing for the RESTORATION OF AN EXISTING TANK
CO5	Planning, Designing and Create layout plan as per regulations using basic survey tools for the TOWN/HOUSING / LAYOUT PLANNING
Course Code	15 CV 71
Course Title	MUNICIPAL AND INDUSTRIAL WASTEWATER TREATMENT
	This course will enable students to;

CO1	Assess characteristics of sewage and appraise sewer materials,layouts showing house drainage connections and suggest a low cost treatment.
CO2	Design the hydraulic elements of sewage for fully and partial flow and aquire the knowledge about dynamics of self purification of a stream when sewage is disposed.
CO3	Evaluate type and degree of treatment and suggest methods of reuse,recycle and disposal.
CO4	Identify the effects of disposing sewage in streams and acquire knowledge on different method in industries to reduce,recycle,reuse and treat wastewater generated.
CO5	Outline on managing sewage and asses environmental impact on industrial effluent issues in different industries
Course Code	15 CV 72
Course Title	Design of RCC and Steel Structures
CO1	Design of Combined Footing and retaining wall.
CO2	Make use of IS code for Design and detailing of Circular and Rectangular water tanks.
CO3	Design and detailing of Simple Portal Frames for different support condition.
CO4	Design of roof truss for different cases of loading.
CO5	Make use of IS code for Design and detailing of plate and Gantry girder.
Course Code	15 CV 73
Course Title	Hydrology and irrigation engineering
	This course will enable students to;
CO1	Understand the concepts of hydrological processes particularly precipitation.
CO2	Understand the factors affecting and measurements of evaporation, evapotranspiration and infiltration.
CO3	Estimate the peak discharge and to develop unit hydrographs and estimation of floods.
CO4	Classify the types, methods of irrigation, soil-water plant relationship and also water

	requirements of crops.
CO5	Able to design the canals.
Course Code	15 CV 741
Course Title	Design of Bridges
CO1	Understand the load distribution and IRC standards.
CO2	Design the slab and T beam bridges.
CO3	Design Box culvert, pipe culvert
CO4	Use bearings, hinges and expansion joints and
CO5	Design Piers and abutments.
Course Code	15 CV 742
Course Title	Ground water Hydraulics
	This course will enable students to;
CO1	Find the characteristics of aquifers.
CO2	Estimate the quantity of ground water by various methods.
CO3	Understand the concepts of steady and unsteady flow.
CO4	Mark the zones of ground water resources.
CO5	select particular type of well and augment the ground water storage.
Course Code	15 CV 751
Course Title	Urban Transport Planning
CO1	Design, conduct and administer surveys to provide the data required for transportation planning.

CO2	Supervise the process of data collection about travel behavior and analyze the data for use in transport planning.
CO3	Develop and calibrate Trip Generation rates for specific types of land use developments.
CO4	Develop and calibrate modal split, trip distribution rates for specific types of land use developments.
CO5	Adopt the steps that are necessary to complete a long-term transportation plan.
Course Code	15 CVL 76
Course Title	Environmental Engineering. Lab
CO1	Acquire capability to conduct experiments and estimate the concentration of different parameters
CO2	Compare the result with standards and ascertain on the purpose of analysis.
CO3	Determine type of treatment, degree of treatment for water and waste water.
CO4	Identify the parameter to be analyzed for the student project work in environmental stream
CO5	Appraise the data obtained from experimental results societal water supply works
Course Code	15CVL77
Course Title	CAD detailing of structures
	This course will enable students to;
CO1	Outline the detailing requirements as per IS456-2000 and IS 800-2007
CO2	Construct CAD detailed construction drawing of beams,Earth retaining retaining walls, water tanks and footings
CO3	Construct CAD detailed construction drawing of steel columns , beams, column bases
CO4	Construct CAD detailed construction drawing of girder beams and trusses
CO5	Appraise the ethics of a Civil Engineer

Course Code	15CVP78
Course Title	Project phase 1 seminar
	This course will enable students to;
CO1	Adapt the skills of Effective Presentation
CO2	Discover students to the 'real' working environment and exposed to current trends of engineering
CO3	Utilize technical resources and interlinking of multidisplinary of engineerings
CO4	propose technical documents and give oral presentations related to the work completed
CO5	motive for future recruitment by potential employers
Course Code	15CV754
Course Title	REINFORCED EARTH STRUCTURES
	This course will enable students to;
CO1	Create an understanding of the basic concepts and components of Reinforced Earth constructions, Classify geosynthetic materials, their testing to outline their properties
CO2	Understand and Analyze the basic concept of Design Reinforced Retaining walls and Soil Nailing
CO3	Understand and Analyze general guidelines for Designing RE foundations
CO4	Understand the Apllications of RE in Roads and Stability Analysis of RE Slopes
CO5	Understand the use of Geosynthetics for different functions and their specific applications in Filters and Landfills
Course Code	15 CV 81
Course Title	:QUANTITY SURVEYING AND CONTRACTS MANAGEMENT
	This course will enable students to;
CO1	Estimate the quantities of vrious Civil Engineering work and arrive at the Cost of civil engineering Project

CO2	Summarize and develop the bill of quantities for earthwork and cost analysis for road works
CO3	Understand and Organize the Specifications for various items of construction and analyze rate for different items of civil works
CO4	List and understand to create the Tender for basic Pre award Contract Management
CO5	Understand the importance of post award contract management and apply the concept of valuation of properties
Course Code	15 CV 82
	Design of Pre Stressed Concrete Structures
	This course will enable students to;
CO1	List out the materials used in the PS Concrete Structures and Analyse the PSC members for stresses at various stages of loading using stress concept, loading balancing concept and Force concept
CO2	Estimate the loss of prestress and deflections in PSC members at service and working condition for both pretensioned and post tensioned members
CO3	Estimate the shear capacity of the section and design the PSC members
CO4	Estimate theflexure capacity of the section and design the PSC members
CO5	Analyse and Design the Composite PSC Members and End anchorages
Course Code	15 CV 831
Course Title	EARTHQUAKE RESISTANT DESIGN OF STRUCTURES
	This course will enable students to;
CO1	Understand the basic knowledge of engineering seismology, magnitude and intensity of earthquake and Identify the types of earthquake, ground motion and its properties.
CO2	Develop response spectra for a given earthquake time history and its implementation to Estimate response of a given structure.
CO3	Understanding of causes and types of damages to civil engineering structures during different earthquake scenarios and Identify torsional irregularity and its consequences

CO4	Analyze multi-storied structures modeled as shear frames and Determine lateral force distribution due to earthquake input motion using IS-1893 procedures.
CO5	Comprehend planning and design requirements of earthquake resistant features of the RCC and Design of Masonry structures thorough exposure to different IS-codes of practices.
Course Code	15 CV 833
Course Title	PAVEMENT DESIGN
CO1	Understand basic concepts of pavement design, Analyze stress, strain and deflection by boussinesq's, burmister's and westergaard's theory
CO2	Determination of ESWL by Equivalent dflection criteria, Flexible pavement design (As per IRC : 37 - 2001)
CO3	List & Explain Caauses, Remedial/Maintenance measures of different types of flexible pavement failures.
CO4	Analyze stress, strain dehaviour of rigid pavement. Design rigid pavement conforming to IRC58-2002
CO5	Evaluate the performance of the pavement and also develops maintenance statement based on site specific requirements.
	15 CV 84
Course Code	INTERNSHIP/ PROFESSIONAL PRACTICE
Course Title	Students will be able to
CO1	Plan for industry set-up related to the construction/ materials testing.
CO2	Make use of laboratories/research organizations/project management consulting firms/QS and QA organizations/ planning
CO3	Take part in adequately to programs by professional bodies with industry exposures at sites/RMC plants
CO4	Appraise Internship /Professional Practice with due approvals
CO5	Outline the concept of avenues related to civil engineering domain and consultation process
Course Code	17 MES 86

Course Title	SEMINAR
CO1	Demonstrate the ability to engage in self learning
CO2	Review scientific literature and interpret the results presented
CO3	Organize and present technical content in a structured manner
CO4	Utilize modern tools (audio/visual aids) for effective presentation of scientific content
CO5	Demonstrate the principles of professional ethics
	15 CVP85
	PROJECT
	This course will enable students to;
CO1	Selection and initiation of individual projects and portfolios of projects
CO2	Illustrate project planning activities that accurately timelines, quality and implement processes
CO3	Demonstrate effective project execution and control techniques that result in successful projects
CO4	outline project closure activities and obtain formal project acceptance.
CO5	Demonstrate a strong working knowledge of ethics and professional responsibility.

III SEMESTER

Course Code															
	ENGINEERING MATHEMATICS (17MAT31)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO2	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO3	2	3	-	-	1	1	-	-	-	1	-	-	-	-	-
CO4	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO5	2	2	-	-	-	1	-	-	-	1	-	-	-	-	-
CO6															
Course Code	STRENGTH OF MATERIALS(17CV32)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	1	3	-	-	-	-	-	-	1	-	-	3
CO2	3	2	-	1	-	-	-	-	-	-	-	-	-	-	-
CO3	3	3	-	1	-	-	-	-	-	-	-	2	1	-	-
CO4	3	3	-	1	3	-	-	-	-	-	-	1	1	-	3
CO5	3	3	-	1	-	-	-	-	-	-	-	2	1	-	-
CO6															
Course Code	Fluid Mechanics(17CV33)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	-	-	-	1	-	-	-	-	1	-	-	1
CO2	3	3	2	1	-	1	1	-	-	-	-	1	-	-	1
CO3	3	3	3	1	2	2	1	-	-	-	-	1	-	-	2
CO4	3	3	3	1	2	2	1	-	1	-	-	1	1	-	2
CO5	3	3	2	1	2	2	1	-	1	-	-	1	1	-	2
CO6															
Course Code	Basic Surveying(17CV34)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO2	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO3	2	3	-	-	1	1	-	-	-	1	-	-	-	-	-
CO4	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO5	2	2	-	-	-	1	-	-	-	1	-	-	-	-	-
CO6															
Course Code	Engineering Geology(17CV35)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	-	2	2	1	-	-	-	2	-	-	2
CO2	2	-	2	1	-	2	2	2	-	-	-	2	-	-	3
CO3	3	2	2	2	-	2	2	1	-	-	-	2	-	-	2
CO4	3	2	2	2	-	2	2	2	-	-	-	2	-	-	2
CO5	1	2	1	2	-	2	3	2	3	-	-	2	-	-	3
CO6															
Course Code	Building Materials and Construction(17CV36)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	1	1	1	-	-	-	-	2	-	2	-
CO2	2	-	-	-	1	1	1	-	-	-	-	2	-	2	-
CO3	2	-	-	-	1	1	1	-	-	-	-	2	-	2	-
CO4	3	2	3	-	1	1	1	-	-	-	-	2	-	2	-
CO5	2	-	-	-	1	1	1	-	-	-	-	2	-	2	-
CO6															
Course Code	Building Materials Testing Laboratory(17CVL37)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	2	3	2	-	-	3	-	-	-	2	3	3
CO2	3	3	-	2	3	2	-	-	3	-	-	-	2	3	3
CO3	2	-	-	-	3	-	-	-	-	-	-	-	1	-	1
CO4	3	2	-	2	1	3	-	-	3	-	-	-	1	-	3
CO5	3	2	-	2	3	-	-	3	3	3	-	-	1	2	3
CO6															
Course Code	Basic Surveying Practice(17CVL38)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	1	3	2	1	1	3	2	-	2	2	2	2
CO2	3	3	2	1	3	2	1	1	3	2	-	2	2	2	2
CO3	3	3	2	1	3	2	1	1	3	2	-	2	2	2	2
CO4	3	3	2	1	3	2	1	1	3	2	-	2	2	2	2
CO5	3	3	2	1	3	2	1	1	3	2	-	2	2	2	2
CO6															

IV SEMESTER

Course Code															
	ENGINEERING MATHEMATICS(17MAT41)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO2	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO3	2	3	-	-	1	1	-	-	-	1	-	-	-	-	-
CO4	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO5	2	2	-	-	-	1	-	-	-	1	-	-	-	-	-
CO6															
Course Code	Analysis of Determinate Structures(17CV42)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1										2		
CO2	3	2	1										2		
CO3	3	2	1										2		
CO4	3	2	2										2		
CO5	3	2	2										2		
CO6															
Course Code	Applied Hydraulics(17CV43)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	-	-	-	-	-	-	-	-	2	2	-	2
CO2	3	3	3	3	-	2	1	-	-	-	-	2	2	-	-
CO3	3	3	-	-	-	1	-	-	-	-	-	-	2	-	-
CO4	3	3	3	-	-	-	-	-	-	-	-	2	2	-	2
CO5	3	3	3	-	-	-	-	-	-	-	-	2	2	-	2
CO6															
Course Code	Concrete Technology(17CV44)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1	1		1	1					1	1	1	1
CO2	2	2	1	1		1	1					1	1	1	1
CO3	2	2	1	1		1	1					1	1	1	1
CO4	2	2	2	2		1	1	1				2	2	2	2
CO5	2	2	1	1		1	1					1	1	1	1
CO6															
Course Code	Basic Geotechnical Engineering(17CV45)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2		3												
CO2	3		2		1									2	
CO3	3		3		1	1									
CO4	3		2	3	2										
CO5	3		2	1	1										
CO6														2	
Course Code	**Advanced Surveying(17CV46)**														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	-	-	1	-	-	-	-	-	2	1	-	1
CO2	3	3	1	-	-	-	-	-	-	-	-	2	3	-	2
CO3	3	2	3	1	1	1	-	-	-	-	-	2	3	-	2
CO4	3	2	2	1	1	1	-	-	-	-	-	2	2	-	2
CO5	3	1	1	1	3	1	-	-	-	-	-	2	2	-	1
CO6															
Course Code	Fluid Mechanics Laboratory(17CVL47)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	3	2	-	2	-	3	-	-	1	-	-	3
CO2	3	3	-	3	2	-	2	-	3	-	-	1	-	-	3
CO3	3	3	-	3	2	-	2	-	3	-	-	1	-	-	3
CO4	3	3	-	3	2	-	2	-	3	-	-	1	-	-	3
CO5	3	3	-	3	2	-	2	-	3	-	-	1	-	-	3
CO6															
Course Code	Engineering Geology Laboratory(17CVL48)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	3	1	2	2	-	-	-	-	2	-	-	-
CO2	3	3	1	3	-	2	2	-	-	-	-	2	-	-	-
CO3	3	3	3	-	-	-	2	-	-	-	-	2	-	-	-
CO4	3	3	1	1	1	-	2	-	2	-	-	2	-	-	1
CO5	3	2	1	2	2	1	3	-	3	-	-	2	-	-	3
CO6															

V SEMESTER

Course Code															
	Design of RC Structural Elements(17CV51)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	1	-	-	-	2	2	-	-	1	2	1	1
CO2	3	3	3	2	-	-	-	2	1	-	-	2	3	2	1
CO3	3	3	3	2	-	-	-	2	1	-	-	2	3	2	1
CO4	3	3	3	2	-	-	-	2	1	-	-	2	3	2	1
CO5	3	3	3	2	-	-	-	2	1	-	-	2	3	2	1
CO6															
Course Code	Analysis of Indeterminate Structures(17CV52)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1										1		
CO2	3	3	1										2		
CO3	3	3	1										2		
CO4	3	3	2										3		
CO5	3	3	2										3		
CO6															
Course Code	Applied Geotechnical Engineering(17CV53)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3											1		
CO2	2		3										2		
CO3	2		3										2		
CO4	2		3										2		
CO5	2		3										2		
CO6															
Course Code	Computer Aided Building Planning and Drawing(17CV54)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	-	-	3	2	-	1	1	1	-	2	2	-	2
CO2	3	1	-	-	3	2	-	1	1	1	-	2	2	-	2
CO3	3	1	-	-	3	2	-	1	1	1	-	2	2	-	2
CO4	3	1	-	-	3	2	-	1	1	1	-	2	2	-	2
CO5	3	1	-	-	3	2	-	1	1	1	-	2	2	-	2
CO6															
Course Code	AIR POLLUTION(17CV551)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	-	-	3	1	-	-	-	-	1	2	-	-
CO2	3	2	2	-	-	2	1	-	-	-	-	1	2	-	-
CO3	3	2	2	-	-	2	1	-	-	-	-	1	2	-	-
CO4	3	2	2	-	-	2	1	-	-	-	-	1	2	-	-
CO5	1	2	2	-	-	3	3	-	-	-	3	1	2	-	-
CO6															
Course Code	TRAFFIC ENGINEERING(17CV561)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	2	-	1	1	-	-	-	-	-	2	-	-	1
CO2	3	2	-	1	-	-	-	-	-	-	-	2	-	-	2
CO3	3	2	3	1	1	1	-	-	-	-	-	1	1	-	2
CO4	3	2	-	2	1	2	2	-	-	-	-	1	-	-	3
CO5	3	1	-	1	3	-	-	-	-	-	-	1	-	-	2
CO6															
Course Code	REMOTE SENSING & GIS (17CV563)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	2	-	-	-	-	-	-	1	-	-	-
CO2	3	2	2	1	3	-	-	-	1	-	-	2	1	-	-
CO3	3	-	3	2	3	2	-	-	1	-	1	2	2	-	-
CO4	3	-	-	2	1	3	3	-	-	-	3	1	3	1	-
CO5	3	1	-	3	3	2	-	-	-	-	1	2	1	-	2

VI SEMESTER

Course Code															
	Construction Management and Entrepreneurship(17CV61)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	3	1	2	2	2	-	-	2	-	-	2
CO2	3	-	-	-	-	3	2	3	2	-	-	2	-	-	-
CO3	3	-	-	-	-	3	1	3	1	-	-	2	-	-	-
CO4	3	-	-	-	1	2	1	1	1	-	-	2	-	-	1
CO5	3	-	-	-	1	3	-	3	3	-	-	2	-	-	1
CO6															
Course Code	Design of steel structural elements(17CV62)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	2	1		1		2				2	2		1
CO2	2	1	2	1		1		2				2	2		1
CO3	2	1	2	1		1		2				2	2		1
CO4	2	1	2	1		1		2				2	2		1
CO5	2	1	2	1		1		2				2	2		1
CO6															
Course Code	Highway Engineering(17CV63)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	2	-	-	2	-	-	-	-	-	2	-	-	-
CO2	3	3	3	2	1	2	-	-	-	-	-	2	-	-	-
CO3	3	3	3	2	1	1	1	-	-	-	-	2	2	2	3
CO4	1	2	3	1	1	2	1	-	-	-	-	2	2	3	3
CO5	3	3	2	1	1	1	2	-	-	-	-	2	-	1	-
CO6															
Course Code	Water Supply and Treatment Engineering(17CV64)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	3	-	3	-	2	-	-	-	2	2	-	-
CO2	3	3	1	3	1	2	-	-	-	-	-	2	3	-	3
CO3	2	2	3	1	-	2	1	-	-	-	-	3	3	1	1
CO4	3	2	3	2	-	2	-	3	-	-	1	2	1	2	1
CO5	3	3	3	2	-	2	2	1	1	1	-	3	3	2	2
CO6															
Course Code	MATRIX METHOD OF STRUCTURAL ANALYSIS (17CV652)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1										1		1
CO2	2	3	1										1		2
CO3	2	3	1										1		2
CO4	2	3	1										1		1
CO5	2	3	1										1		2
CO6															
Course Code	ABM (17CV653)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	2	-	1	2
CO2	3	1	2	1	1	1	1	-	-	-	-	2	-	1	2
CO3	3	-	-	-	-	2	1	1	-	-	-	2	-	1	2
CO4	3	-	-	2	-	-	-	1	-	-	-	2	-	1	2
CO5	3	-	-	1	3	-	2	-	-	-	-	2	-	1	2
CO6															
Course Code	WRM (17CV661)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	1	-	-	1	1	-	-	-	1	-	-	-
CO2	2	2	2	2	-	1	2	2	2	2	3	2	1	-	2
CO3	2	1	2	-	-	1	2	2	2	-	2	2	1	-	-
CO4	2	1	3	-	-	1	2	2	2	1	-	2	2	-	-
CO5	3	1	1	3	-	1	2	3	1	1	-	2	2	-	3

CO6															

Course Code	GEOTECHNICAL ENGINEERING Laboratory(17CVL57)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	1		2							2	2	1
CO2	2	2	2	2		2							2	2	1
CO3	2	1	2	3		1							1	3	3
CO4	2	2	2	2		2							2	2	1
CO5	1	1	1	1		1							1	1	1
CO6															

Course Code	Concrete and Highway Materials Laboratory(17CVL58)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	-	1	1	-	3	-	2	-	-	2	-		3
CO2	3	1	-	1	1	-	3	-	2	-	-	2	-		3
CO3	3	1	2	2	1	-	3	-	2	-	-	3	2		3
CO4	3	1	-	1	1	-	3	-	2	-	-	2	-		3
CO5	3	1	-	1	1	-	3	-	2	-	-	2	-		3
CO6													-		

VII SEMESTER

Course Code	MUNICIPAL AND INDUSTRIAL WASTE WATER ENGINEERING(17CV71)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2			-	2	3	1	-	-	-	1	1	2	1
CO2	3	2	2	3	-	1	2	-	-	-	-	2	1	-	3
CO3	3	2	2	-	3	3	2	-	-	-	-	3	3	2	1
CO4	3	2	3	2	-	2	3	2	-	-	-	3	3	2	3
CO5	3	3	3	3	-	2	3	2	-	-	1	3	3	2	3
CO6															

Course Code	DESIGN OF RCC AND STEEL STRUCTURES(17CV72)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															

Course Code	HYDROLOGY AND IRRIGATION ENGINEERING(17CV73)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	-	-	-	-	-	-	1	2	-	2
CO2	3	2	1	1	1	-	-	-	-	-	-	1	2	-	1
CO3	3	2	1	2	-	-	1	1	-	-	-	1	2	-	2
CO4	3	3	2	2	-	1	2	-	-	-	-	1	2	-	2
CO5	3	2	3	1	-	1	1	1	1	-	-	2	3	-	2
CO6															

Course Code	DESIGN OF BRIDGES(17CV741)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															

Course Code	GROUND WATER HYDRAULICS (17CV742)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	-	-		-	-	-	-	-	-	-	-	-	-
CO2	3	2	-	-	1	-	-	-	-	-	-	-	1	-	1
CO3	3	2	1	1		-	-	-	-	-	-	-	1	-	1
CO4	2	1	1	2	2	-	1	-	-	-	-	-	-	-	2
CO5	2	1	2		2	2	2	1	1	-	-	2	2	-	2
CO6															

Course Code	URBAN TRANSPORT PLANNING(17CV751)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	2	1	1	-	-	-	-	-	1			
CO2	3	-	-	2	1	1	-	-	-	-	-	1			
CO3	3	3	3	1	-	1	-	-	-	-	-	2			
CO4	3	3	3	1	-	-	-	-	-	-	-	2			
CO5	3	2	3	1	-	-	-	-	-	-	-	2			
CO6															

Course Code	RETROFITTING AND REHABILITATION (17CV753)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															

Course Code	REINFORCED EARTH STRUCTURE (17CV754)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															

Course Code	ENVIRONMENTAL ENGINEERING LAB (17CVL76)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3		3	3	-	-	1	2	-	-	2	1	-	1
CO2	2	3	2	-	-	2	-	1	-	-	-	2	1	-	2
CO3	2	2	3	1	-	2	1	-	-	-	-	3	3	1	2
CO4	3	3	3	2	-	2	1	-	3	1	-	1	1	-	1
CO5	2	2	3	1	-	2	1	-	-	-	-	3	3	1	2

Course Code	CADS LAB (17CVL77)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															

Course Code	PROJ/PHASE1 (17CVP78)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															

CO6															

Course Code	SOFTWARE APPLICATION LAB (17CVL67)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2		1	2	-	-	1	-	1	-	2	2	-	2
CO2	3	2		1	2	-	-	1	-	1	-	2	2	-	2
CO3	3	2		1	2	-	-	1	-	1	-	2	2	2	2
CO4	3	2		1	2	-	-	1	-	1	-	2	2	-	2
CO5	3	2		1	2	-	-	1	-	1	-	2	2	-	2
CO6															

Course Code	Extensive Survey Project /Camp(17CVP68)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	1	1	1	1	3	1	2	1	3	2	3
CO2	3	3	3	3	1	1	1	1	3	1	2	1	3	2	3
CO3	3	3	3	3	1	1	1	1	3	1	2	1	3	2	3
CO4	3	3	3	3	1	1	1	1	3	1	2	1	3	2	3
CO5	3	3	3	3	1	1	1	1	3	1	2	1	3	2	3
CO6															

VIII SEMESTER

Course Code	DESIGN OF PRESTRESSED CONCRETE ELEMENTS(18CV81)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	1		1		2				2	2		1
CO2	3	2	3	1		1		2				2	2		1
CO3	3	2	3	1		1		2				2	2		1
CO4	3	2	3	1		1		2				2	2		1
CO5	3	2	3	1		1		2				2	2		1
CO6															

Course Code	(18CV82)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															

Course Code	EARTHQUAKE RESISTANT DESIGN OF STRUCTURES(17CV831)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															

Course Code	PAVEMENT DESIGN(17CV833)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	1	-	-	-	-	-	-	-	3	3	-	-
CO2	3	3	3	1	-	-	-	-	-	-	-	3	3	-	-
CO3	2	3	1	2	2	2	-	-	-	-	-	-	-	-	3
CO4	3	3	3	-	-	-	-	-	-	-	-	3	3	-	-
CO5	2	2	3	2	2	2	-	-	-	-	-	2	-	-	3
CO6															

Course Code	INTERNSHIP (17CV84)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															

Course Code	PROJECT/PHASE2 (17CV85)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															

Course Code	SEMINAR(17CVS86)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															

Course Code	17 MAT 31
Course Title	TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES
CO1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering.
CO2	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.
CO3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems
CO4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods
CO5	Determine the externals of functional using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.
Course Code	17 CV 32
Course Title	STRENGTH OF MATERIALS
	This course will enable students to;
CO1	Determine stresses and strains for different materials and understand strength of structural elements
CO2	Interpret and Evaluate internal forces developed and resistance mechanism for one dimensional and two dimensional structural elements under the action of compound stresses
CO3	Evaluate and Develop shear force and bending moment variations on different beams.
CO4	Assess the behavior of torsional members and understand different failure theories.
CO5	Analyse internal forces and stresses induced on structural elements and evaluate the behaviour of columns and struts.
Course Code	17 CV 33
Course Title	Fluid Mechanics
	This course will enable students to;

CO1	Explain the importance, application and inter relationship of various properties of fluids.
CO2	Evaluate hydrostatic forces and its application to practical problem solutions.
CO3	Apply the principles of kinematics and hydrodynamics for practical application.
CO4	Analyze and design of pipes and pipe networks for various pressure and losses.
CO5	Estimate the discharge using various flow measuring devices.
Course Code	17 CV 34
Course Title	Basic Surveying
	This course will enable students to;
CO1	1. To Posses a knowledge of fundamental principles of Geodetics and linear measurement of vertical and horizontal plane.
CO2	2. To Measure angular dimensions in both horizontal and vertical plane to arrive at solutions to basic surveying problems.
CO3	3. To obtain and analyse geo-spatial data to appropriate engineering problems by using modern instruments.
CO4	4. To measure geodetic data and evaluate difference in elevation by using Levelling instruments and different techniques.
CO5	5. To Analyse the obtained spatial data and compute areas and volumes. Represent 3D data on plane figures as contours
Course Code	17 CV 35
Course Title	Engineering Geology
	This course will enable students to;
CO1	To understand the internal structure and composition of the earth.
CO2	To comprehend the properties, occurrence and uses of minerals in various industries.
CO3	To understand about geo-morphological agents such as river, wind, sea waves, and their implications in implementing civil engineering projects.

CO4	To perceive knowledge about the structures of the rocks and their considerations in the selection of site for dams, tunnels, bridges and highways.
CO5	To learn the application of Topographic maps, remote sensing and GIS in Civil engineering practices and natural resource management.
Course Code	17 CV 36
Course Title	BUILDING MATERIALS AND CONSTRUCTION
	This course will enable students to;
CO1	Utilize suitable materials for buildings and select type of test to examine their properties.
CO2	Select different type of foundation for different soil type and Classification of Masonry.
CO3	Understand the concepts of lintels, arches,floors and roofs related to its construction and comprision inbetween.
CO4	Obtain and apply essential knowledge for geometrical design of stairs and select doors, windows, ventilators and formwork as per standard recommendation.
CO5	List the methods of plastering, pointing and types of paints and know the importance of damp proofing.
Course Code	17 CVL 37
Course Title	BUILDING MATERIALS TESTING LABORATORY
	This course will enable students to;
CO1	Utilize basic knowledge of mathematics and engineering to find strength in tension,compression, shear and torsion.
CO2	Identify, formulate and solve engineering problems of structural elements subjected to flexure.
CO3	Utilize techniques, skills and modern tools necessary for engineering.
CO4	Evaluate the impact of engineering solutions on the society and explain the contemporary issues regarding failure of structures due to unsuitable materials.
CO5	Assess and communicate effectively the mechanical properties of materials.
Course Code	17 CVL 38

Course Title	BASIC SURVEYING PRACTICE
	This course will enable students to;
CO1	1. To apply the basic principles of engineering surveying for linear measurements and setting out the experiments by Direct and Indirect method.
CO2	2. To measure angular dimensions and setting out the geomertical figures in horizontal Plane by using compass.
CO3	3. To measure geodetic data, evaluate difference in elevation and plotting of Profile by using Levelling instruments and different field procedures.
CO4	4. To measure Linear and angular dimensions in both horizontal and vertical plane by using theodolite with different field procedures.
CO5	5. To understand the working of Minor instruments Clinometer, Ceylon Ghat tracer, Box sextant, Hand level, Planimeter, nautical sextant and Pentagraph.
Course Code	17 MAT 41
Course Title	COMPLEX ANALYSIS, PROBABILITY AND STATISTICAL METHODS
CO1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
CO2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
CO3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
CO4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
CO5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.
Course Code	17 CV 42
Course Title	ANALYSIS OF DETERMINATE STRUCTURES
	This course will enable students to;

CO1	Solve the static & kinematic indeterminacies for beams, frames & trusses and Evaluate the forces in determinate trusses by method of joints and sections.
CO2	Evaluate the deflection of the cantilever, simply supported and overhanging beams by Double integration and Macaulay's method and to Determine the non-prismatic beams by Moment area and Conjugate beam methods
CO3	Understand the energy principles & energy theorems & its applications to Determine the deflections of beams, trusses and bent frames by strain energy, castigliano's theorem and unit load methods
CO4	Determine the stress resultants in three hinged arches and to Evaluate the stress resultants in cables for different loading conditions.
CO5	Understand the concept of influence lines for beams and Construct the ILD diagram for the moving loads.
Course Code	17 CV 43
Course Title	APPLIED HYDRAULICS
	This course will enable students to;
CO1	Develop mathematical modeling, compute the parametric values in prototype, analyse and determine stability of floating and submerged bodies. (PO1-H, PO2-H,PO12- M, PSO1-M, PSO3-M)
CO2	Design open channels of various cross sections and develop economical channel sections (PO1-H, PO2-H,PO3-H,PO6- M, PO7- L, PO12- M, PSO1- M)
CO3	Apply Energy concepts to flow in open channel sections, Calculate Energy dissipation, Compute water surface profiles at different conditions (PO1-H, PO2-H,PO3-L,PO6- L, PSO1-M)
CO4	Design impulse turbines for the given data and apply their operation characteristics under different operating conditions and analyze performance (PO1-H, PO2-M,PO3-H,PO12- M, PSO1- L, PSO3-M)
CO5	Design radial flow reaction turbines and centrifugal pump for the given data and apply their operation characteristics under different operating conditions and analyze performance (PO1-H, PO2-M,PO3-H,PO12- M, PSO1- L, PSO3-M)
Course Code	17 CV 44

Course Title	CONCRETE TECHNOLOGY
	This course will enable students to;
CO1	Identify the properties and role of constituents of concrete
CO2	list out the properties of fresh concrete and Apply fundamental knowledge of properties of fresh concrete in design mix of concrete and also study the effect of admixtures on fresh concrete
CO3	Obtain and apply essential knowledge of hardened properties of concrete and also study about non destructing tests in evaluating the strength of concrete
CO4	Design a concrete mix which accomplishes the required properties for fresh and hardened concrete.
CO5	Choose waste materials as alternative and innovative materials for use in concrete.
Course Code	17 CV 45
Course Title	BASIC GEOTECHNICAL ENGINEERING
CO1	Will acquire an understanding of the procedures to determine index properties of any type of soil, classify the soil based on its index properties
CO2	Will be able to determine compaction characteristics of soil and apply that knowledge to assess field compaction procedures
CO3	Will be able to determine permeability property of soils and acquires conceptual knowledge about stresses due to seepage and effective stress; Also acquire ability to estimate seepage losses across hydraulic structure
CO4	Ability to solve practical problems related to estimation of consolidation settlement of soil deposits also time required for the same
CO5	Will be able to estimate shear strength parameters of different types of soils using the data of different shear tests and comprehend Mohr-Coulomb failure theory.
Course Code	15 CV 46
Course Title	ADVANCED SURVEYING

CO1	Apply geometric principles to arrive at solutions to surveying problems.
CO2	Analyze spatial data using appropriate computational and analytical techniques.
CO3	Design proper types of curves for deviating type of alignments.
CO4	Use the concepts of advanced data capturing methods necessary for engineering practice
CO5	To learn various advanced equipments being used in the total survey and applications in GIS
Course Code	17 CVL 47
Course Title	FM LAB
	This course will enable students to;
CO1	Calibrate flow measuring devices
CO2	Determine the force exerted by jet of water on vanes
CO3	Measure discharge and head losses in pipes
CO4	Evaluate performance of turbines
CO5	Evaluate performance of pumps
Course Code	17 CVL 48
Course Title	Engineering Geology Laboratory
	This course will enable students to;
CO1	To identify the minerals and rocks based on their inherent properties and uses in civil engineering
CO2	To interpret the geological maps related to civil engineering projects.
CO3	To learn the dip and strike, borehole problems, thickness of geological formation related to foundation, tunnels, reservoirs and mining.
CO4	To understand subsurface geological conditions through a geophysical techniques and watershed management

CO5	To visit the civil engineering projects like dams, reservoirs, tunnels, quarry sites etc.
Course Code	17 CV 51
Course Title	DESIGN OF RC STRUCTURAL ELEMENTS
CO1	Understand the Design philosophy ,principles and deflection failure on RC members.
CO2	Analyse engineering Problems of RC elements subjected to flexure, shear and torsion as for relavent codes.
CO3	Design of beams for shear, combined bending and torsion as for relavent codes.
CO4	Demonstrate the Procedural knowledge in Designs of RC structural elements such as slabs and stairsas for relavent codes.
CO5	Design the columns and footings subjected to axial load, uni-axial and bi-axial moments as for relavent codes.
Course Code	17 CV 52
Course Title	ANALYSIS OF INDETERMINATE STRUCTURES
	This course will enable students to;
CO1	Determine the moment in indeterminate beams and frames of no sway and sway, having variable moment of inertia and subsidence using the slope deflection method and Construct the BMD
CO2	Determine the moment in indeterminate beams and frames of no sway and sway using the moment distribution method and Construct the BMD
CO3	Determine the moments and Construct the bending moment diagram for continuous beams and frames by Kani's method.
CO4	Construct the bending moment diagram for beams and frames using flexibility method and Analyze the indeterminate plane trusses by system approach
CO5	Analyze the continuous beams, frames and plane trusses by system stiffness method and Construct bending moment diagram for beams & frames.
Course Code	17 CV 53

Course Title	APPLIED GEOTECHNICAL ENGINEERING
CO1	Ability to plan and execute geotechnical site investigation program for different civil engineering projects
CO2	Understanding of stress distribution and resulting settlement beneath the loaded footings on sand and clayey soils
CO3	Ability to estimate factor of safety against failure of slopes and to compute lateral pressure distribution behind earth retaining structures
CO4	Ability to determine bearing capacity of soil and achieve proficiency in proportioning shallow isolated and combined footings for uniform bearing pressure
CO5	Capable of estimating load carrying capacity of single and group of piles
Course Code	17 CV 54
Course Title	Computer Aided Building Planning and Drawing
	This course will enable students to;
CO1	Gain a broad understanding of planning and designing of buildings
CO2	Prepare, read and interpret the structural element drawings in a professional set up.
CO3	Prepare, read and interpret the cross section of pavement, septic tank, rainwater harvesting, etc... drawings in a professional set up.
CO4	Know the procedures of submission of drawings and Develop working and submission drawings for building plan & sectional elevation
CO5	Plan and design a residential or public building as per the given requirements
Course Code	17 CV 551
Course Title	Air Pollution and Control
	This course will enable students to;
CO1	Identify the major sources of air pollution and asses their effects on health and environment (PO1-M, PO2-M,PO6-H, PO7-L,PO12-L, PSO1-M)

CO2	Evaluate the dispersion of air pollutants in the atmosphere and develop air quality monitoring models. (PO1-H, PO2-M,PO3-M,PO6-M, PO7-L,PO12-L, PSO1-M)
CO3	Ascertain and evaluate sampling techniques for atmospheric and stack pollutants for different indoor and outdoor pollutants. (PO1-H, PO2-M,PO3-M,PO6-M, PO7-L,PO12-L, PSO1-M)
CO4	Choose and design control techniques for particulate and gaseous emissions. (PO1-H, PO2-M,PO3-M,PO6-M, PO7-L,PO12-L, PSO1-M)
CO5	Identify automobile pollutants, global environmental concerns and assess and communicate effectively through Environmental Protection acts (PO1-L, PO2-M,PO6-H, PO7-H,PO10- H,PO12-L, PSO1-M)
Course Code	17 CV 561
Course Title	TRAFFIC EANGINEERING
CO1	Understand the human factors and vehicular factors in traffic engineering design.
CO2	Conduct different types of traffic surveys and analysis of collected data using statistical concepts.
CO3	Use an appropriate traffic flow theory and to comprehend the capacity & signalized intersection analysis.
CO4	Understand the Concept of Traffic Safety and Environment
CO5	Understand the basic knowledge of Intelligent Transportation System.
Course Code	17 CVL 563
Course Title	Remote Sensing and GIS
	This course will enable students to;
CO1	Understand the basic concepts of remote sensing
CO2	Analyze satellite imagery and extract the required units.
CO3	Formualte the GIS data and prepare the thematic maps
CO4	Make use of the thematic maps for various applications

CO5	Perceive the knowledge on digital image processing
Course Code	17 CVL 57
Course Title	GEOTECHNICAL ENGINEERING LAB
CO1	Physical and index properties of the soil
CO2	Classify based on index properties and field identification
CO3	To determine OMC and MDD, plan and assess field compaction program
CO4	Shear strength and consolidation parameters to assess strength and deformation characteristics
CO5	In-situ shear strength characteristics (SPT- Demonstration)
Course Code	17 CVL58
Course Title	Concrete and Highway Materials lab.
CO1	Conduct appropriate laboratory experiments and interpret the results
CO2	Determine the quality and suitability of cement
CO3	Design appropriate concrete mix
CO4	Determine strength and quality of concrete
CO5	Test the road aggregates and bitumen for their suitability as road material & Test the soil for its suitability as sub grade soil for pavements.
Course Code	17 CV 61
Course Title	Construction Management and Entrepreneurship
	This course will enable students to;
CO1	Understand the construction management process.
CO2	Understand and solve variety of issues that are encountered during resource management.

CO3	Adapt the professional obligations effectively with global outlook
CO4	Build the knowledge engineering economics.
CO5	Understand the concept of entrepreneurship.
Course Code	17 CV 62
Course Title	DESIGN OF STEEL STRUCTURAL ELEMENTS
CO1	Possess a knowledge of Steel Structures Advantages and Disadvantages of Steel structures, steel code provisions and plastic behaviour of structural steel
CO2	Analyse and Design bolted connections in steel structures
CO3	Analyse and Design welded connections in steel structures
CO4	Design compression and tension member in steel structures
CO5	Design of slab bases and Beam sections
Course Code	17 CV 63
Course Title	Highway Engineering
CO1	Understand basic concepts of transportation engineering, planing to fit best alignment mong alternate proposals
CO2	Design road geometrics, structural components of pavement and drainage. Understand the Concept of capability of proposing a new alignment or re-alignment of existing roads.
CO3	Evaluate the engineering properties of the materials and suggest the suitability of the same for pavement construction, Design ESWL concept
CO4	Design blending of different materials used in bituminous mix, Understand the concpt of construction of different type of pavement
CO5	Evaluate the highway economics by few select methods and also Understand a basic knowledge of various highway financing concepts.

Course Code	17 CV 64
Course Title	WATER SUPPLY AND TREATMENT ENGINEERING
	This course will enable students to;
CO1	Make use of different standards of water demand in population forecasting and design average and peak water demand for an area/community
CO2	Evaluate available sources of water, quantitatively and qualitatively and assess the water quality, environmental significance of various characteristics of water sample as per BIS standards
CO3	Acquire the knowledge to decide on levels of treating water and design primary and secondary treatment units along with the advancements in it.
CO4	Identify and categorize hardness in water and suggest conventional or advanced techniques of treatment for hardness removal and also will acquire the knowledge in disinfecting water.
CO5	Design a comprehensive water treatment plant and distribution system in regard to pipes,materials and pumps on the basis of field visit.
Course Code	17 CV 652
Course Title	MATRIX METHOD OF STRUCTURAL ANALYSIS
	This course will enable students to;
CO1	Evaluate the structural systems to develop flexibility and stiffness matrices for simple problems.
CO2	Identify, formulate and solve engineering problems with respect to flexibility matrices as applied to continuous beams, rigid frames and trusses.
CO3	Identify, formulate and solve engineering problems with respect to stiffness matrices as applied to continuous beams, rigid frames and trusses.
CO4	Understand and Analyze solving problems involving temperature changes and lack of fit.
CO5	Identify, formulate and solve engineering problems by application of concepts of direct stiffness method as applied to continuous beams and trusses.
Course Code	17 CV 653

Course Title	Alternative Building Materials
	This course will enable students to;
CO1	Solve the problems of Environmental issues concerned to building materials and cost effective building technologies;
CO2	Choose appropriate type of masonry unit and mortar for civil engineering constructions; also they are able to Design Structural Masonry Elements under Axial Compression.
CO3	Analyse different alternative building materials, Also capable of choose suitable agro and industrial wastes as a building material.
CO4	Apply alternatives for wall constructions, Ferro cement, ferroconcrete, masonry vaults and domes using IS specifications.
CO5	Identify the different equipment for production of alernative materials.
Course Code	17 CV 661
Course Title	Water Resource Management
	This course will enable students to;
CO1	Illustrate the potential of groundwater and surface water resources.
CO2	Explain the issues related to planning and management of water resources.
CO3	Propose IWRM in different regions.
CO4	Explain legal issues of water policy.
CO5	Select the method for water harvesting based on the area.
Course Code	17 CVL 67
Course Title	SOFTWARE APPLICATION LAB
	This course will enable students to;
CO1	Able to apply the knowledge of softwares for analysis of trusses, continuous beams and portal frames.
CO2	Analyse the multi storied frame structure.

CO3	Understand the basic features of project management software.
CO4	Able to create decision maps using GIS.
CO5	Make use of EXCEL for preparing spresd sheets for various civil engineering works.
Course Code	17 CVL 68
Course Title	EXTENSIVE SURVEY PROJECT
	This course will enable students to;
CO1	Apply surveying knowledge,to do team work for a detailed survey required for project execution and Create detailed drawing for the NEW TANK PROJECT.
CO2	Identify sources of water by basic tools and Apply different methods for calculation of quantity of water to carry out Survey work and Create detailed drawing for the WATER SUPPLY AND SANITARY PROJECT
CO3	Apply surveying knowledge, basic tools & team work for preliminary and detailed investigations to align a new road and to Create detailed drawing for the HIGHWAY PROJECT
CO4	Plan and Redesign using basic survey tools and to Create detailed drawing for the RESTORATION OF AN EXISTING TANK
CO5	Planning, Designing and Create layout plan as per regulations using basic survey tools for the TOWN/HOUSING / LAYOUT PLANNING
Course Code	17 CV 71
Course Title	MUNICIPAL AND INDUSTRIAL WASTEWATER TREATMENT
	This course will enable students to;
CO1	Appraise on characterising sewage,sewer materials,layouts showing house drainage connections and suggesting a low cost treatment.
CO2	Design the hydraulic elements of sewage for fully and partial flow and also aquire the knowledge about dynamics of self purification of a stream when sewage is disposed.
CO3	Evaluate degree/type of treatment and method disposal,reuse and recycle.
CO4	Identify the effects of disposing sewage in streams and acquire knowledge on different method

	in industries to reduce,recycle,reuse and treat wastewater generated
CO5	Outline on managing sewage and industrial effluent issues in different industries
Course Code	17 CV 72
Course Title	Design of RCC and Steel Structures
CO1	Design of Combined Footing and retaining wall.
CO2	Make use of IS code for Design and detailing of Circular and Rectangular water tanks.
CO3	Design and detailing of Simple Portal Frames for different support condition.
CO4	Design of roof truss for different cases of loading.
CO5	Make use of IS code for Design and detailing of plate and Gantry girder.
Course Code	15 CV 73
Course Title	Hydrology and irrigation engineering
	This course will enable students to;
CO1	Understand the concepts of hydrological processes particularly precipitation.
CO2	Understand the factors affecting and measurements of evaporation, evapotranspiration and infiltration.
CO3	Estimate the peak discharge and to develop unit hydrographs and estimation of floods.
CO4	Classify the types, methods of irrigation, soil-water plant relationship and also water requirements of crops.
CO5	Able to design the canals.
Course Code	17 CV 741
Course Title	Design of Bridges

CO1	Understand the load distribution and IRC standards.
CO2	Design the slab and T beam bridges.
CO3	Design Box culvert, pipe culvert
CO4	Use bearings, hinges and expansion joints and
CO5	Design Piers and abutments.
Course Code	17 CV 742
Course Title	Ground water Hydraulics
	This course will enable students to;
CO1	Find the characteristics of aquifers.
CO2	Estimate the quantity of ground water by various methods.
CO3	Understand the concepts of steady and unsteady flow.
CO4	Mark the zones of ground water resources.
CO5	select particular type of well and augment the ground water storage.
Course Code	17 CV 751
Course Title	Urban Transport Planning
CO1	Design, conduct and administer surveys to provide the data required for transportation planning.
CO2	Supervise the process of data collection about travel behavior and analyze the data for use in transport planning.
CO3	Develop and calibrate Trip Generation rates for specific types of land use developments.
CO4	Develop and calibrate modal split, trip distribution rates for specific types of land use developments.
CO5	Adopt the steps that are necessary to complete a long-term transportation plan.

Course Code	17 CV 753
Course Title	REHABILITATION AND RETROFITTING OF STRUCTURES
CO1	Identify the causes for structural (Concrete) deterioration.
CO2	Assess the type and extent of damage and carry out damage assessment of structures through various types of tests
CO3	Recommend preventive measures against influencing factors
CO4	Recommend maintenance requirements of the buildings
CO5	Select suitable material and suggest an appropriate method for repair and rehabilitation.
	(17 CVL76)
	ENVIRONMENTAL ENGG. LAB
	student will be able to:
CO1	Acquire capability to conduct experiments and estimate the concentration of different parameters
CO2	Compare the result with standards and ascertain on the purpose of analysis.
CO3	Determine type of treatment, degree of treatment for water and waste water.
CO4	Identify the parameter to be analyzed for the student project work in environmental stream
CO5	Appraise the data obtained from experimental results societal water supply works
Course Code	15CVL77
Course Title	CAD detailing of structures
	This course will enable students to;
CO1	Outline the detailing requirements as per IS456-2000 and IS 800-2007
CO2	Construct CAD detailed construction drawing of beams,Earth retaining retaining walls, water tanks and footings

CO3	Construct CAD detailed construction drawing of steel columns , beams, column bases
CO4	Construct CAD detailed construction drawing of girder beams and trusses
CO5	Appraise the ethics of a Civil Engineer
Course Code	15CVP78
Course Title	Project phase 1 seminar
	This course will enable students to;
CO1	Adapt the skills of Effective Presentation
CO2	Discover students to the 'real' working environment and exposed to current trends of engineering
CO3	Utilize technical resources and interlinking of multidisplinary of engineerings
CO4	propose technical documents and give oral presentations related to the work completed
CO5	motive for future recruitment by potential employers
Course Code	
Course Title	
CO1	
CO2	
CO3	
CO4	
CO5	
Course Code	15 CV 81
Course Title	:QUANTITY SURVEYING AND CONTRACTS MANAGEMENT
	This course will enable students to;

CO1	Estimate the quantities of vrious Civil Engineering work and arrive at the Cost of civil engineering Project
CO2	Summarize and develop the bill of quantities for earthwork and cost analysis for road works
CO3	Understand and Organize the Specifications for various items of construction and analyze rate for different items of civil works
CO4	List and understand to create the Tender for basic Pre award Contract Management
CO5	Understand the importance of post award contract management and apply the concept of valuation of properties
Course Code	15 CV 82
	Design of Pre Stressed Concrete Structures
	This course will enable students to;
CO1	List out the materials used in the PS Concrete Structures and Analyse the PSC members for stresses at various stages of loading using stress concept, loading balancing concept and Force concept
CO2	Estimate the loss of prestress and deflections in PSC members at service and working condition for both pretensioned and post tensioned members
CO3	Estimate the shear capacity of the section and design the PSC members
CO4	Estimate theflexure capacity of the section and design the PSC members
CO5	Analyse and Design the Composite PSC Members and End anchorages
Course Code	15 CV 831
Course Title	EARTHQUAKE RESISTANT DESIGN OF STRUCTURES
	This course will enable students to;
CO1	Understand the basic knowledge of engineering seismology, magnitude and intensity of earthquake and Identify the types of earthquake, ground motion and its properties.
CO2	Develop response spectra for a given earthquake time history and its implementation to Estimate response of a given structure.

CO3	Understanding of causes and types of damages to civil engineering structures during different earthquake scenarios and Identify torsional irregularity and its consequences
CO4	Analyze multi-storied structures modeled as shear frames and Determine lateral force distribution due to earthquake input motion using IS-1893 procedures.
CO5	Comprehend planning and design requirements of earthquake resistant features of the RCC and Design of Masonry structures thorough exposure to different IS-codes of practices.
Course Code	15 CV 833
Course Title	PAVEMENT DESIGN
CO1	Understand basic concepts of pavement design, Analyze stress, strain and deflection by boussinesq's, burmister's and westergaard's theory
CO2	Determination of ESWL by Equivalent dflection criteria, Flexible pavement design (As per IRC : 37 - 2001)
CO3	List & Explain Caauses, Remedial/Maintenance measures of different types of flexible pavement failures.
CO4	Analyze stress, strain dehaviour of rigid pavement. Design rigid pavement conforming to IRC58-2002
CO5	Evaluate the performance of the pavement and also develops maintenance statement based on site specific requirements.
	15 CV 84
Course Code	INTERNSHIP/ PROFESSIONAL PRACTICE
Course Title	Students will be able to
CO1	Plan for industry set-up related to the construction/ materials testing.
CO2	Make use of laboratories/research organizations/project management consulting firms/QS and QA organizations/ planning
CO3	Take part in adequately to programs by professional bodies with industry exposures at sites/RMC plants
CO4	Appraise Internship /Professional Practice with due approvals

CO5	Outline the concept of avenues related to civil engineering domain and consultation process
Course Code	17 MES 86
Course Title	SEMINAR
CO1	Demonstrate the ability to engage in self learning
CO2	Review scientific literature and interpret the results presented
CO3	Organize and present technical content in a structured manner
CO4	Utilize modern tools (audio/visual aids) for effective presentation of scientific content
CO5	Demonstrate the principles of professional ethics
	15 CVP85
	PROJECT
	This course will enable students to;
CO1	Selection and initiation of individual projects and portfolios of projects
CO2	Illustrate project planning activities that accurately timelines, quality and implement processes
CO3	Demonstrate effective project execution and control techniques that result in successful projects
CO4	outline project closure activities and obtain formal project acceptance.
CO5	Demonstrate a strong working knowledge of ethics and professional responsibility.

III SEMESTER

Course Code															
Course Title	18CV31														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO2	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO3	2	3	-	-	1	1	-	-	-	1	-	-	-	-	-
CO4	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO5	2	2	-	-	-	1	-	-	-	1	-	-	-	-	-
CO6															

Course Code	(18CV32)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	1	3	-	-	-	-	-	-	1	-	-	3
CO2	3	2	-	1	-	-	-	-	-	-	-	-	-	-	-
CO3	3	3	-	1	-	-	-	-	-	-	-	2	1	-	-
CO4	3	3	-	1	3	-	-	-	-	-	-	1	1	-	3
CO5	3	3	-	1	-	-	-	-	-	-	-	2	1	-	-
CO6															

Course Code	(18CV33)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	-	-	-	1	-	-	-	-	1	-	-	1
CO2	3	3	2	1	-	1	1	-	-	-	-	1	-	-	1
CO3	3	3	3	1	2	2	1	-	-	-	-	1	-	-	2
CO4	3	3	3	1	2	2	1	-	1	-	-	1	1	-	2
CO5	3	3	2	1	2	2	1	-	1	-	-	1	1	-	2
CO6															

Course Code	BUILDING MATERIALS AND CONSTRUCTION (18CV34)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	3	-	1	1	-	-	-	-	1	-	2	-
CO2	-	-	-		-	2	1	-	-	-	-	1	-	3	-
CO3	-	-	-		-	1	2	-	-	-	-	1	-	3	-
CO4	1	2	3		-	1	1	-	-	-	-	1	-	2	-
CO5	1	-	-		-	1	2	-	-	-	-	1	-	3	-
CO6															

Course Code	BASIC SURVEYING (18CV35)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO2	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO3	2	3	-	-	1	1	-	-	-	1	-	-	-	-	-
CO4	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO5	2	2	-	-	-	1	-	-	-	1	-	-	-	-	-
CO6															

Course Code	(18CV36)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	1	-	-	-	-	-	-	-	2	-	-	-
CO2	2	2	-	1	-	2	-	-	1	-	-	2	1	-	-
CO3	3	3	2	3	3	3	2	3	2	-	-	2	2	2	-
CO4	2	2	1	2	1	3	3	1	2	-	-	2	2	2	-
CO5	2	-	-	-	3	-	2	-	2	-	-	2	1	-	-
CO6															

Course Code	(18CVL37)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	-	-	3	2	-	1	1	1	-	2	2	-	2
CO2	3	1	-	-	3	2	-	1	1	1	-	2	2	-	2
CO3	3	1	-	-	3	2	-	1	1	1	-	2	2	-	2
CO4	3	1	-	-	3	2	-	1	1	1	-	2	2	-	2
CO5	3	1	-	-	3	2	-	1	1	1	-	2	2	-	2
CO6															

Course Code	(18CVL38)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	2	3	2	-	-	3	-	-	-	2	3	3
CO2	3	3	-	2	3	2	-	-	3	-	-	-	2	3	3
CO3	2	-	-	-	3	-	-	-	-	-	-	-	1	-	1
CO4	3	2	-	2	1	3	-	-	3	-	-	-	1	-	3
CO5	3	2	-	2	3	-	-	-	3	3	-	-	1	2	3
CO6															

IV SEMESTER

Course Code	(18MAT41)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO2	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO3	2	3	-	-	1	1	-	-	-	1	-	-	-	-	-
CO4	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO5	2	2	-	-	-	1	-	-	-	1	-	-	-	-	-
CO6															

Course Code	Analysis of Determinate Structures(18CV42)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2										2		
CO2	3	2	2										2		
CO3	3	2	1										2		
CO4	3	2	1										2		
CO5	3	2	2										2		
CO6															

Course Code	APPLIED HYDRAULICS(18CV43)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	-	-	-	-	-	-	-	-	2	2	-	2
CO2	3	3	3	-	-	2	1	-	-	-	-	2	2	-	-
CO3	3	3	-	-	-	1	-	-	-	-	-	-	2	-	-
CO4	3	3	3	-	-	-	-	-	-	-	-	2	2	-	2
CO5	3	3	3	-	-	-	-	-	-	-	-	2	2	-	2
CO6															

Course Code	CONCRETE TECHNOLOGY (18CV44)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1	1		1	1					1	1	1	1
CO2	2	2	1	1		1	1					1	1	1	1
CO3	2	2	1	1		1	1					1	1	1	1
CO4	2	2	2	2		1	1	1				2	2	2	2
CO5	2	2	1	1		1	1					1	1	1	1
CO6															

Course Code	ADVANCED SURVEYING (18CV45)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1			1						2	1	-	1
CO2	3	3	1			1						2	3	-	2
CO3	3	2	3	1	1	1						2	3	-	2
CO4	3	2	1	2	1	-						2	2	-	2
CO5	3	1	1	1	3	1		1	1			2	2	-	1
CO6															

Course Code	WATER SUPPLY & TEATMENT ENGINEERING (18CV46)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	3	-	3	-	2	-	-	-	2	2	-	-
CO2	3	3	1	3	1	3	1	2	-	-	-	2	3	-	3
CO3	2	2	3	1	-	2	1	-	-	-	-	2	3	1	1
CO4	3	2	3	2	-	2	-	3	-	-	1	2	1	2	1
CO5	3	3	3	1	-	2	2	1	1	1	-	3	3	2	2
CO6															

Course Code	(18CVL47)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	-	2	2	1	-	-	-	2	-	-	2
CO2	2	-	2	1	-	2	2	2	-	-	-	2	-	-	3
CO3	3	2	2	2	-	2	2	1	-	-	-	2	-	-	2
CO4	3	2	2	2	-	2	2	2	-	-	-	2	-	-	2
CO5	1	2	1	2	-	2	3	2	3	-	-	2	-	-	3
CO6															

Course Code	(18CVL48)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	3	2	-	2	-	3	-	-	1	-	-	3
CO2	3	3	-	3	2	-	2	-	3	-	-	1	-	-	3
CO3	3	3	-	3	2	-	2	-	3	-	-	1	-	-	3
CO4	3	3	-	3	2	-	2	-	3	-	-	1	-	-	3
CO5	3	3	-	3	2	-	2	-	3	-	-	1	-	-	3
CO6															

V SEMESTER

Course Code															
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	1	-	1	1	3	2	-	-	1	2	-	1
CO2	3	3	3	3	1	-	-	-	1	-	-	2	3	-	3
CO3	3	3	3	3	1	-	-	-	1	-	-	2	3	-	3
CO4	3	3	3	3	-	-	-	-	1	-	-	2	3	-	3
CO5	3	3	3	3	-	-	-	-	1	-	-	2	3	-	3
CO6															

Course Code	Analysis of Indeterminate Structures(18CV52)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1										1		
CO2	3	3	1										2		
CO3	3	3	1										2		
CO4	3	3	2										3		
CO5	3	3	2										3		
CO6															

Course Code	Design of RC Structural Elements(18CV53)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	1	-	-	-	2	2	-	-	1	2	1	1
CO2	3	3	3	2	-	-	-	2	1	-	-	2	3	2	1
CO3	3	3	3	2	-	-	-	2	1	-	-	2	3	2	1
CO4	3	3	3	2	-	-	-	2	1	-	-	2	3	2	1
CO5	3	3	3	2	-	-	-	2	1	-	-	2	3	2	1
CO6															

Course Code	Computer Aided Building Planning and Drawing(18CV54)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															

Course Code	MUNICIPAL WASTE WATER ENGINEERING(18CV55)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	2	3	1	-	-	-	1	1	2	1	1
CO2	2	2	3	-	1	2	-	-	-	-	2	1	-	3	3
CO3	2	2	-	3	3	2	-	-	-	-	3	3	2	1	1
CO4	2	2	-	3	3	2	-	-	-	-	3	3	2	1	2
CO5	2	2	3	1	-	2	1	-	-	-	-	3	3	1	2
CO6															

Course Code	HIGHWAY ENGINEERING(18CV56)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	2			1						2	-	-	-
CO2	3	3	3	2	1	2	-	-	-	-	-	2	-	-	-
CO3	3	3	3	2	1	1	1	-	-	-	-	2	2	2	3
CO4	1	2	3	1	1	2	1	-	-	-	-	2	2	3	3
CO5	3	3	2	1	1	1	2	-	-	-	-	2	-	1	-
CO6															

Course Code	REMOTE SENSING & GIS (18CV563)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															

VI SEMESTER

Course Code	Design of steel structural elements(18CV61)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	2	1		1		2				2	2		1
CO2	2	1	2	1		1		2				2	2		1
CO3	2	1	2	1		1		2				2	2		1
CO4	2	1	2	1		1		2				2	2		1
CO5	2	1	2	1		1		2				2	2		1
CO6															

Course Code															
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															

Course Code	HYDROLOGY AND IRRIGATION ENGINEERING(18CV63)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	2	-	-	1	-	-	-	-	-	2	-	-	-
CO2	3	3	3	2	1	2	-	-	-	-	-	2	-	-	-
CO3	3	3	3	2	1	1	1	-	-	-	-	2	2	2	3
CO4	1	2	3	1	1	2	1	-	-	-	-	2	2	3	3
CO5	3	3	2	1	1	1	2	-	-	-	-	2	-	1	-
CO6															

Course Code	Water Supply and Treatment Engineering(18CV64)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															

Course Code	MATRIX (18CV652)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															

Course Code	ABM (18CV653)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	2	1	2	1
CO2	3	-	1	2	-	1	1	-	-	-	-	2	1	2	1
CO3	3	-	-	-	2	1	1	-	-	-	-	2	1	2	1
CO4	3	-	-	-	2	-	-	-	-	-	-	2	1	2	1
CO5	3	-	-	-	1	3	-	2	-	-	-	2	1	2	1
CO6															

Course Code	WRM (18CV661)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	1	-	-	1	1	-	-	-	1	1	-	-
CO2	2	2	2	2	-	1	2	2	2	2	3	2	1	-	2
CO3	2	1	2	-	-	1	2	2	2	-	2	2	1	-	-

CO4																
CO5																
CO6																
Course Code	Basic Surveying Practice(18CVL57)															
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
CO1	3	3	2	1	3	2	1	1	3	2		2	2	2	2	
CO2	3	3	2	1	3	2	1	1	3	2		2	2	2	2	
CO3	3	3	2	1	3	2	1	1	3	2		2	2	2	2	
CO4	3	3	2	1	3	2	1	1	3	2		2	2	2	2	
CO5	3	3	2	1	3	2	1	1	3	2		2	2	2	2	
CO6																
Course Code	Concrete and Highway Materials Laboratory(18CVL58)															
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
CO1																
CO2																
CO3																
CO4																
CO5																

VII SEMESTER

Course Code	(18CV71)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2					2			1			1	2	3	
CO2	2					1			1			1	2	3	
CO3	1					2						1	2	3	
CO4	2					1						1	2	3	
CO5						1					3	1	2	2	
Course Code	(18CV72)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Course Code	AIR POLLUTION (18CV732)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	-	-	3	1	-	-	-	-	1	2	-	-
CO2	3	2	2	-	-	2	1	-	-	-	-	1	2	-	-
CO3	3	2	2	-	-	2	1	-	-	-	-	1	2	-	-
CO4	3	2	2	-	-	2	1	-	-	-	-	1	2	-	-
CO5	1	2	2	-	-	3	3	-	-	-	3	1	2	-	-
CO6															
Course Code	EARTHQUAKE RESISTANT DESIGN OF STRUCTURES(18CV741)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2		1						3	2	2	
CO2	3	3	3	2		1						3	2	2	
CO3	3	3	2	2		1						3	1	2	
CO4	3	3	3	2		1						3	2	2	
CO5	3	3	3	2		1						3	2	2	
CO6															
Course Code	GROUND WATER HYDRAULICS (18CV742)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Course Code	PAVEMENT MATERIALS AND CONSTRUCTION(18CV733)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	2	-	-	1	-	-	-	-	-	2	-	-	-
CO2	3	3	3	2	1	2	-	-	-	-	-	2	-	-	-
CO3	3	3	3	2	1	1	1	-	-	-	-	2	2	2	3
CO4	1	2	3	1	1	2	1	-	-	-	-	2	2	3	3
CO5	3	3	2	1	1	1	2	-	-	-	-	2	-	1	-
CO6															
Course Code	RETROFITTING AND REHABILITATION (18CV753)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Course Code	REINFORCED EARTH STRUCTURE (18CV754)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Course Code	ENVIRONMENTAL ENGINEERING LAB (18CVL76)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Course Code	CADS LAB (18CVL77)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Course Code	PROJ/PHASE1 (18CVP78)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															

CO4	2	1	3	-	-	1	2	2	2	1	-	2	2	-	-	
CO5	3	1	3	-	1	2	3	1	1	-	1	2	2	-	3	
CO6																
Course Code	ENVIRONMENTAL ENGINEERING LAB (18CVL67)															
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
CO1	3	3	-	3	3	-	-	1	2	-	-	2	1	-	1	
CO2	2	3	2	-	-	2	-	1	-	-	-	2	1	-	2	
CO3	2	2	3	1	-	2	1	-	-	-	-	3	3	1	2	
CO4	3	3	3	2	-	2	1	-	3	1	-	1	1	-	1	
CO5	2	2	3	1	-	2	1	-	-	-	-	3	3	1	2	
CO6																
Course Code	Extensive Survey Project /Camp(18CVP68)															
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
CO1																
CO2																
CO3																
CO4																
CO5																
CO6																

VIII SEMESTER

Course Code	QUANTITY SURVEYING AND CONTRACTS MANAGEMENT(18CV81)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Course Code	DESIGN OF PRESTRESSED CONCRETE ELEMENTS(18CV82)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Course Code															
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Course Code	PAVEMENT DESIGN(18CV833)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	1	-	-	-	-	-	-	-	3	3	-	-
CO2	3	3	3	1	-	-	-	-	-	-	-	3	3	-	-
CO3	2	3	1	2	2	2	-	-	-	-	-	-	-	-	3
CO4	3	3	3	-	-	-	-	-	-	-	-	3	3	-	-
CO5	2	2	3	2	2	2	-	-	-	-	-	2	-	-	3
CO6															
Course Code	INTERNSHIP (18CV84)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Course Code	PROJECT/PHASE2 (18CV85)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Course Code	SEMINAR(18CVS86)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															

Course Code	18 MAT 31
Course Title	TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES
CO1	have an insight into Laplace transforms, Difference equations .
CO2	understand the applications of Fourier series,
CO3	Analyzed Fourier transforms and Z-Transforms
CO4	develop the proficiency in variational calculus and solving ODE's arising in engineering applications, using numerical method
CO5	understand the concepts of Numerical Solution of Second Order ODE's and calculus of Variations
Course Code	18 CV 32
Course Title	STRENGTH OF MATERIALS
	This course will enable students to;
CO1	Determine stresses and strains for different materials and understand strength of structural elements
CO2	Interpret and Evaluate internal forces developed and resistance mechanism for one dimensional and two dimensional structural elements under the action of compound stresses
CO3	Evaluate and Develop shear force and bending moment variations on different beams.
CO4	Analyse internal forces and stresses induced on structural elements and Assess the behavior of torsional members
CO5	Evaluate slope and deflections of beams And Assess the behaviour of columns and struts.
Course Code	18 CV 33
Course Title	Fluid Mechanics
CO1	Explain the importance, application and inter relationship of various properties of fluids.

CO2	Evaluate hydrostatic forces and its application to practical problem solutions.
CO3	Apply the principles of kinematics and hydrodynamics for practical application.
CO4	Analyze and design of pipes and pipe networks for various pressure and losses.
CO5	Estimate the discharge using various flow measuring devices.
Course Code	18 CV 34
Course Title	BUILDING MATERIALS AND CONSTRUCTION
	This course will enable students to;
CO1	Utilize suitable materials for buildings and select type of test to examine their properties.
CO2	Select different type of foundation for different soil type and Classification of Masonry.
CO3	Understand the concepts of lintels, arches,Compare types of floors and roofs related to its construction
CO4	Obtain and apply essential knowledge for geometrical design of stairs and select doors, windows, ventilators and formwork as per standard recommendation.
CO5	List the methods of plastering, pointing and types of paints and know the importance of damp proofing.
Course Code	18 CV 35
Course Title	Basic Surveying
	This course will enable students to;
CO1	1. To Posses a knowledge of fundamental principles of Geodetics and linear measurement of vertical and horizontal plane.
CO2	2. To Measure angular dimensions in horizontal plane to arrive at solutions to basic surveying problems.
CO3	3. To measure geodetic data and evaluate difference in elevation by using Levelling instruments and different techniques.
CO4	4. Compile geodetic data to process and perform the analysis for surveying problems by applying different techniques of Plane table surveying.

CO5	5. Analyse the obtained spatial data and compute areas and volumes. Represent 3D data on plane figures as contours
Course Code	18 CV 36
Course Title	Engineering Geology
	This course will enable students to;
CO1	To inculcate the importance of earth's interior and application of Geology in civil engineering. Attempts are made to highlight the industrial applications of minerals.
CO2	To build awareness among Civil engineers regarding the use of rocks as building materials.
CO3	To provide knowledge on dynamic Geology and its importance in modifying the physical character of rocks which cause rocks suitable or unsuitable in different civil engineering projects such as Dams, bridges, tunnels and highways.
CO4	To develop the ground water management regarding diversified geological formations, climatologically dissimilarity which are prevailed in the country. To highlight the concept of rain water harvesting.
CO5	To understand the application of Remote Sensing and GIS, Natural disaster and management and environmental awareness.
Course Code	18 CVL 37
Course Title	Computer Aided Building Planning and Drawing
	This course will enable students to;
CO1	Gain a broad understanding of planning and designing of buildings
CO2	Prepare, read and interpret the structural element drawings in a professional set up.
CO3	Prepare, read and interpret the cross section of pavement, septic tank, rainwater harvesting, etc... drawings in a professional set up.
CO4	Know the procedures of submission of drawings and Develop working and submission drawings for building plan & sectional elevation
CO5	Plan and design a residential or public building as per the given requirements
Course Code	18 CVL 38

Course Title	BUILDING MATERIALS TESTING LABORATORY
	This course will enable students to;
CO1	Utilize basic knowledge of mathematics and engineering to find strength in tension,compression, shear and torsion.
CO2	Identify, formulate and solve engineering problems of structural elements subjected to flexure.
CO3	Utilize techniques, skills and modern tools necessary for engineering.
CO4	Evaluate the impact of engineering solutions on the society and explain the contemporary issues regarding failure of structures due to unsuitable materials.
CO5	Assess and communicate effectively the mechanical properties of materials.
Course Code	18 MAT 41
Course Title	COMPLEX ANALYSIS, PROBABILITY AND STATISTICAL METHODS
CO1	provide an insight into applications of complex variables, conformal mapping and special functions
CO2	develop transformations and line integrals and associated applications
CO3	understand the probability distribution of discrete, continuous random variables and joint probability
CO4	to understand the curve fitting techniques and statistical methods
CO5	Analyze the distribution occurring Joint Probability distribution and Sampling Theory and associated applications
Course Code	18 CV 42
Course Title	ANALYSIS OF DETERMINATE STRUCTURES
	This course will enable students to;
CO1	Solve the static & kinematic indeterminacies for beams, frames & trusses and Understand the concept of influence lines for beams and Construct the ILD diagram for beams and trusses

CO2	Construct ILD and Analyse the beams and trusses subjected to moving concentrated multiple loads
CO3	Evaluate the deflection of the cantilever, simply supported and overhanging beams by Moment area method and To Determine non-prismatic beams by Conjugate beam method.
CO4	Understand the energy principles & energy theorems & its applications to Determine the deflections of beams, trusses and bent frames by strain energy, castigliano's theorem and unit load methods
CO5	Determine the stress resultants in three hinged arches and to Evaluate the stress resultants in cables for different loading conditions.
Course Code	18 CV 43
Course Title	APPLIED HYDRAULICS
	This course will enable students to;
CO1	Develop mathematical modeling, compute the parametric values in prototype, analyse and determine stability of floating and submerged bodies. (PO1-H, PO2-H,PO12- M, PSO1-M, PSO3-M)
CO2	Design open channels of various cross sections and develop economical channel sections (PO1-H, PO2-H,PO3-H,PO6- M, PO7- L, PO12- M, PSO1- M)
CO3	Apply Energy concepts to flow in open channel sections, Calculate Energy dissipation, Compute water surface profiles at different conditions (PO1-H, PO2-H,PO3-L,PO6- L, PSO1-M)
CO4	Design impulse turbines for the given data and apply their operation characteristics under different operating conditions and analyze performance (PO1-H, PO2-M,PO3-H,PO12- M, PSO1- L, PSO3-M)
CO5	Design radial flow reaction turbines and centrifugal pump for the given data and apply their operation characteristics under different operating conditions and analyze performance (PO1-H, PO2-M,PO3-H,PO12- M, PSO1- L, PSO3-M)
Course Code	18 CV 44
Course Title	CONCRETE TECHNOLOGY
	This course will enable students to;

CO1	Identify the properties and role of constituents of concrete
CO2	list out the properties of fresh concrete and Apply fundamental knowledge of properties of fresh concrete in design mix of concrete and also study the effect of admixtures on fresh concrete
CO3	Obtain and apply essential knowledge of hardened properties of concrete and also study about non destructing tests in evaluating the strength of concrete
CO4	Design a concrete mix which accomplishes the required properties for fresh and hardened concrete.
CO5	Choose waste materials as alternative and innovative materials for use in concrete.
Course Code	18 CV 45
Course Title	ADVANCED SURVEYING
CO1	Apply geometric principles to arrive at solutions to surveying problems.
CO2	Analyze spatial data using appropriate computational and analytical techniques.
CO3	Design proper types of curves for deviating type of alignments.
CO4	Use the concepts of advanced data capturing methods necessary for engineering practice
CO5	To learn various advanced equipments being used in the total survey and applications in GIS
Course Code	18 CV 46
Course Title	WATER SUPPLY AND TREATMENT ENGINEERING
	This course will enable students to;
CO1	Make use of different standards of water demand in population forecasting and design average and peak water demand for an area/community
CO2	Evaluate available sources of water, quantitatively and qualitatively and assess the water quality, environmental significance of various characteristics of water sample as per BIS standards
CO3	Acquire the knowledge to decide on levels of treating water and design primary and secondary

	treatment units along with the advancements in it.
CO4	Identify and analyse hardness in water and be able to suggest conventional or advanced techniques of treatment for hardness removal and also will acquire the knowledge in disinfecting water.
CO5	Design a comprehensive water treatment plant and distribution system in regard to pipes,materials and pumps.
Course Code	18 CVL 47
Course Title	Engineering Geology Laboratory
	This course will enable students to;
CO1	Analyse the minerals, rocks and utilize them effectively in civil engineering practices.
CO2	Interpret and understand the geological conditions of the area for implementation of civil engineering projects.
CO3	Interpret subsurface information such as thickness of soil, weathered zone, depth of hard rock and saturated zone by using geophysical methods.
CO4	Understand the techniques in the interpretation of geological maps and LANDSAT Imageries to find out the lineaments and other structural features for the given area.
CO5	Understand and identify the different geological structures in the field which are encountered during the construction of civil engineering projects.
Course Code	18 CVL 48
Course Title	FM LAB
CO1	Calibrate flow measuring devices
CO2	Determine the force exerted by jet of water on vanes
CO3	Measure discharge and head losses in pipes
CO4	Evaluate performance of turbines
CO5	Evaluate performance of pumps

Course Code	18 CV 51
Course Title	Construction Management and Entrepreneurship
	This course will enable students to;
CO1	Understand the construction management process.
CO2	Understand and solve variety of issues that are encountered during resource management.
CO3	Adapt the professional obligations effectively with global outlook
CO4	Build the knowledge engineering economics.
CO5	Understand the concept of entrepreneurship.
Course Code	18 CV 52
Course Title	Analysis of Indeterminate structures
	This course will enable students to;
CO1	Determine the moment in indeterminate beams and frames of no sway and sway, having variable moment of inertia and subsidence using the slope deflection method and Construct the BMD
CO2	Determine the moment in indeterminate beams and frames of no sway and sway using the moment distribution method and Construct the BMD
CO3	Determine the moments and Construct the bending moment diagram for continuous beams and frames by Kani's method.
CO4	Construct the bending moment diagram for beams and frames using flexibility method and Analyze the indeterminate plane trusses by system approach
CO5	Analyze the continuous beams, frames and plane trusses by system stiffness method and Construct bending moment diagram for beams & frames.
Course Code	18 CV 53
Course Title	DESIGN OF RC STRUCTURAL ELEMENTS
	This course will enable students to;

CO1	Understand the Design philosophy ,principles and deflection failure on RC members.
CO2	Analyse engineering Problems of RC elements subjected to flexure, shear and torsion as for relavent codes.
CO3	Design of beams for shear, combined bending and torsion as for relavent codes.
CO4	Demonstrate the Procedural knowledge in Designs of RC structural elements such as slabs and stairsas for relavent codes.
CO5	Design the columns and footings subjected to axial load, uni-axial and bi-axial moments as for relavent codes.
Course Code	18 CV 54
Course Title	
	BASIC GEOTECHNICAL ENGINEERING
CO1	Will acquire an understanding of the procedures to determine index properties of any type of soil, classify the soil based on its index properties
CO2	Will be able to determine compaction characteristics of soil and apply that knowledge to assess field compaction procedures
CO3	Will be able to determine permeability property of soils and acquires conceptual knowledge about stresses due to seepage and effective stress; Also acquire ability to estimate seepage losses across hydraulic structure
CO4	Ability to solve practical problems related to estimation of consolidation settlement of soil deposits also time required for the same
CO5	Will be able to estimate shear strength parameters of different types of soils using the data of different shear tests and comprehend Mohr-Coulomb failure theory.
Course Code	18 CV 55
Course Title	
	MUNICIPAL WASTEWATER ENGINEERING
CO1	Appraise on characterising sewage,sewer materials,layouts showing house drainage connections and suggesting a low cost treatment.

CO2	Design the hydraulic elements of sewage for fully and partial flow and also aquire the knowledge about dynamics of self purification of a stream when sewage is disposed.
CO3	Evaluate degree/type of treatment and method disposal,reuse and recycle.
CO4	Infer on biological parameters in waste water and utilize in its treatment
CO5	Acertain modern and advanced treatment for wastewater and apraise rural sanitation.
Course Code	18 CV 56
Course Title	HIGHWAY ENGINEERING
CO1	Gain knowledge of different modes of transportation systems, history, development of highways and the organizations associated with research and development of the same in INDIA.
CO2	Understand Highway planning and development considering the essential criteria's (engineering and financial aspects, regulations and policies, socio economic impact).
CO3	Get insight to different aspects of geometric elements and train them to design geometric elements of a highway network.
CO4	Understand pavement and its components, pavement construction activities and its requirements
CO5	Gain the skills of evaluating the highway economics by B/C, NPV, IRR methods and also introduce the students to highway financing concepts.
Course Code	18 CVL 57
Course Title	BASIC SURVEYING PRACTICE
CO1	To apply the basic principles of engineering surveying for linear measurements and setting out the experiments by Direct and Indirect method.
CO2	To measure angular dimensions and setting out the geomertical figures in horizontal Plane by using compass.
CO3	To measure geodetic data, evaluate difference in elevation and plotting of Profile by using

	Levelling instruments and different field procedures.
CO4	To measure Linear and angular dimensions in both horizontal and vertical plane by using theodolite with different field procedures.
CO5	To understand the working of Minor instruments Clinometer, Ceylon Ghat tracer, Box sextant, Hand level, Planimeter, nautical sextant and Pentagraph.
Course Code	18 CVL 58
Course Title	CONCRETE AND HIGHWAY MATERIALS LABORATORY
CO1	To learn the procedure of testing concrete ingredients and properties of concrete as per standard code recommendations.
CO2	To learn the procedure of testing bituminous materials as per standard code recommendations.
CO3	To relate material characteristics to various application of construction.
CO4	Determine strength and quality of concrete
CO5	Test the road aggregates and bitumen for their suitability as road material & Test the soil for its suitability as sub grade soil for pavements.
Course Code	18 CV 61
Course Title	DESIGN OF STEEL STRUCTURES
CO1	1. Understand fundamentals of Steel structures as per relevant codal provisions and Analyse Plastic behaviour of structural steel.
CO2	2. Analyse and Design Bolted and Welded connections in steel structures as per codal provisions
CO3	3. Design Compression member and column Lacings & battens in steel structures as per codal provisions
CO4	4. Design Tension member and Column bases in steel structures as per codal provisions
CO5	5. Design of Steel Beams as per codal provisions

Course Code	18 CV 62
Course Title	Applied Geotechnical Engineering
	Students will be able to:
CO1	Ability to plan and execute geotechnical site investigation program for different civil engineering projects
CO2	Understanding of stress distribution and resulting settlement beneath the loaded footings on sand and clayey soils
CO3	Ability to estimate factor of safety against failure of slopes and to compute lateral pressure distribution behind earth retaining structures
CO4	Ability to determine bearing capacity of soil and achieve proficiency in proportioning shallow isolated and combined footings for uniform bearing pressure
CO5	Capable of estimating load carrying capacity of single and group of piles
Course Code	18 CV 63
Course Title	Hydrology and irrigation engineering
CO1	Understand the concepts of hydrological processes particularly precipitation.
CO2	Understand the factors affecting and measurements of evaporation, evapotranspiration and infiltration.
CO3	Estimate the peak discharge and to develop unit hydrographs and estimation of floods.
CO4	Classify the types, methods of irrigation, soil-water plant relationship and also water requirements of crops.
CO5	Able to design the canals.
Course Code	18 CV 641
Course Title	MATRIX METHOD OF STRUCTURAL ANALYSIS
	This course will enable students to;

CO1	Evaluate the structural systems to develop flexibility and stiffness matrices for simple problems.
CO2	Identify, formulate and solve engineering problems with respect to flexibility matrices as applied to continuous beams, rigid frames and trusses.
CO3	Identify, formulate and solve engineering problems with respect to stiffness matrices as applied to continuous beams, rigid frames and trusses.
CO4	Understand and Analyze solving problems involving temperature changes and lack of fit.
CO5	Identify, formulate and solve engineering problems by application of concepts of direct stiffness method as applied to continuous beams and trusses.
Course Code	18 CV 643
Course Title	Alternative Building Materials
	This course will enable students to;
CO1	Evaluate the structural systems to develop flexibility and stiffness matrices for simple problems.
CO2	Identify, formulate and solve engineering problems with respect to flexibility matrices as applied to continuous beams, rigid frames and trusses.
CO3	Identify, formulate and solve engineering problems with respect to stiffness matrices as applied to continuous beams, rigid frames and trusses.
CO4	Understand and Analyze solving problems involving temperature changes and lack of fit.
CO5	Identify, formulate and solve engineering problems by application of concepts of direct stiffness method as applied to continuous beams and trusses.
Course Code	18 CV 652
Course Title	MATRIX METHOD OF STRUCTURAL ANALYSIS
	This course will enable students to;
CO1	Evaluate the structural systems to application of concepts of flexibility and stiffness matrices for simple problems.
CO2	Identify, formulate and solve engineering problems with respect to flexibility matrices as

	applied to continuous beams, rigid frames and trusses.
CO3	Identify, formulate and solve engineering problems with respect to stiffness matrices as applied to continuous beams, rigid frames and trusses.
CO4	Understand and Analyze solving problems involving temperature changes and lack of fit.
CO5	Identify, formulate and solve engineering problems by application of concepts of direct stiffness method as applied to continuous beams and trusses.
Course Code	18CVL 67
Course Title	Environmental Engineering. Lab
	This course will enable students to;
CO1	Acquire capability to conduct experiments and estimate the concentration of different parameters
CO2	Compare the result with standards and ascertain on the purpose of analysis.
CO3	Determine type of treatment, degree of treatment for water and waste water.
CO4	Identify the parameter to be analyzed for the student project work in environmental stream
CO5	Appraise the data obtained from experimental results societal water supply works
Course Code	18CVL66
Course Title	SOFTWARE APPLICATION LAB
CO1	Able to apply the knowledge of softwares for analysis of trusses, continuous beams and portal frames.
CO2	Analyse the multi storied frame structure.
CO3	Understand the basic features of project management software.
CO4	Able to create decision maps using GIS.
CO5	Make use of EXCEL for preparing spresd sheets for various civil engineering works.

Course Code	
Course Title	
CO1	
CO2	
CO3	
CO4	
CO5	
Course Code	
Course Title	
CO1	
CO2	
CO3	
CO4	
CO5	
Course Code	18 CV 71
Course Title	
CO1	Estimate the quantities of vrious Civil Engineering work and arrive at the Cost of civil engineering Project
CO2	Summarize and develop the bill of quantities for earthwork and cost analysis for road works
CO3	Understand and Organize the Specifications for various items of construction and analyze rate

	for different items of civil works
CO4	List and understand to create the Tender for basic Pre award Contract Management
CO5	Understand the importance of post award contract management and apply the concept of valuation of properties
Course Code	15 CV 72
Course Title	Design of RCC and Steel Structures
CO1	Design of Combined Footing and retaining wall.
CO2	Make use of IS code for Design and detailing of Circular and Rectangular water tanks.
CO3	Design and detailing of Simple Portal Frames for different support condition.
CO4	Design of roof truss for different cases of loading.
CO5	Make use of IS code for Design and detailing of plate and Gantry girder.
Course Code	18 CV 732
Course Title	Air Pollution and Control
	This course will enable students to;
CO1	Identify the major sources of air pollution and asses their effects on health and environment (PO1-M, PO2-M,PO6-H, PO7-L,PO12-L, PSO1-M)
CO2	Evaluate the dispersion of air pollutants in the atmosphere and develop air quality monitoring models. (PO1-H, PO2-M,PO3-M,PO6-M, PO7-L,PO12-L, PSO1-M)
CO3	Ascertain and evaluate sampling techniques for atmospheric and stack pollutants for different indoor and outdoor pollutants. (PO1-H, PO2-M,PO3-M,PO6-M, PO7-L,PO12-L, PSO1-M)
CO4	Choose and design control techniques for particulate and gaseous emissions. (PO1-H, PO2-M,PO3-M,PO6-M, PO7-L,PO12-L, PSO1-M)
CO5	Identify automobile pollutants, global environmental concerns and assess and communicate effectively through Environmental Protection acts (PO1-L, PO2-M,PO6-H, PO7-H,PO10- H,PO12-L, PSO1-M)

Course Code	18 CV 733
Course Title	PAVEMENT MATERIALS AND CONSTRUCTION
CO1	Expose students to different materials which are used in pavement construction, impart knowledge about the engineering properties required.
CO2	To train students to perform various types of bituminous mix designs as per the guidelines (MORTH).
CO3	Student will get knowledge about different highway construction equipment with their suitability and adaptability in various field scenarios.
CO4	Expose students to construction practice and quality control aspects of embankment, flexible and rigid pavement as per the required specifications (MORTH).
CO5	To introduce students to possible improvisation in various layers of pavement to increase the structural strength by the use of non basic materials (DLC, polythene sheets).
Course Code	18 CV 741
Course Title	EARTHQUAKE ENGINEERING
	This course will enable students to;
CO1	Understand the basic knowledge of engineering seismology, magnitude and intensity of earthquake and Identify the types of earthquake, ground motion and its properties.
CO2	Develop response spectra for a given earthquake time history and its implementation to Estimate response of a given structure.
CO3	Understanding of causes and types of damages to civil engineering structures during different earthquake scenarios and Identify torsional irregularity and its consequences
CO4	Analyze multi-storied structures modeled as shear frames and Determine lateral force distribution due to earthquake input motion using IS-1893 procedures.
CO5	Comprehend planning and design requirements of earthquake resistant features of the RCC and Design of Masonry structures thorough exposure to different IS-codes of practices.
Course Code	18 CV 743

Course Title	REINFORCED EARTH STRUCTURES
CO1	1. Create an understanding of theConcept of reinforcing the soil, reinforcing Materials and its testing;
CO2	2. Analyze the concept of RE so as to ascertain stability of RE structures and understand the concept of soil nailing
CO3	3. Analze the design concepts of Reinforced soil foundations.
CO4	4. Understand the use of Geosynthetics for Strengthning Roads and Slopes
CO5	5. Understand the adoption of Geosynthetics for designing Filters,drains and Landfills
Course Code	18VL76
Course Title	COMPUTER AIDED DETAILING OF STRUCTURES
CO1	Outline the detailing requirements as per IS456-2000 and IS 800-2007.
CO2	Design and create CAD detailed construction drawing of beams, Earth retaining walls, water tanks and isolated and combined footings
CO3	Design and create CAD detailed construction drawing of steel columns, beams and column bases
CO4	Design and create CAD detailed construction drawing of girder beams and trusses
CO5	Appraise the knowledge of ethics and professional responsibility.
Course Code	18CVL77
Course Title	GEOTECHNICAL ENGINEERING LABORATORY
	This course will enable students to;
CO1	determine Physical and index properties of the soil
CO2	Classify based on index properties and field identification

CO3	To determine OMC and MDD, plan and assess field compaction program
CO4	Shear strength and consolidation parameters to assess strength and deformation characteristics
CO5	In-situ shear strength characteristics (SPT- Demonstration)
Course Code	18CVP78
Course Title	
	PROJECT WORK PHASE -1
CO1	1. Identify a current problem through literature/field/case studies and define the background objectives and methodology for solving engineering problems
CO2	2. Discover to the 'real' working environment and examine to current trends of engineering
CO3	3. Implement and evaluate the technology/processes at the laboratory level and /Technology (using Software's) through interlinking of multidisciplinary of engineering's
CO4	4. Perceive technical documents and give oral presentations related to the work completed
CO5	5. Demonstrate the knowledge of ethical, professional and social responsibilities
Course Code	
Course Title	
CO1	
CO2	
CO3	
CO4	
CO5	
Course Code	18 CV 81
Course Title	

	Design of Pre Stressed Concrete Structures
CO1	List out the materials used in the PS Concrete Structures and Analyse the PSC members for stresses at various stages of loading using stress concept, loading balancing concept and Force concept
CO2	Estimate the loss of prestress and deflections in PSC members at service and working condition for both pretensioned and post tensioned members
CO3	Estimate the flexure capacity of the section and design the PSC members
CO4	Estimate the shear capacity of the section and design the PSC members
CO5	Analyse and Design the End block of PSC Members.
Course Code	18 CV 821
CO1	Understand the load distribution and IRC standards.
CO2	Design the slab and T beam bridges.
CO3	Design Box culvert, pipe culvert
CO4	Use bearings, hinges and expansion joints and
CO5	Design Piers and abutments.
Course Code	18 CV 824
Course Title	
	REHABILITATION AND RETROFITTING OF STRUCTURES
CO1	Identify the causes for structural (Concrete) deterioration.
CO2	Assess the type and extent of damage and carry out damage assessment of structures through various types of tests
CO3	Recommend preventive measures against influencing factors

CO4	Recommend maintenance requirements of the buildings
CO5	Select suitable material and suggest an appropriate method for repair and rehabilitation.
Course Code	18 CV 825
Course Title	PAVEMENT DESIGN
CO1	Gain knowledge about the process of collecting data required for design, factors affecting pavement design, and maintenance of pavement.
CO2	Excel in the path of analysis of stress, strain and deflection in pavement.
CO3	Understand design concepts of flexible pavement by various methods (CBR, IRC 37-2001, Mcleods, Kansas) and also the same of rigid pavement by IRC 58-2002
CO4	Understand the various causes leading to failure of pavement and remedies for the same.
CO5	Develop skills to perform functional and structural evaluation of pavement by suitable methods.
	15 CV 84
Course Code	INTERNSHIP/ PROFESSIONAL PRACTICE
Course Title	Students will be able to
CO1	Plan for industry set-up related to the construction/ materials testing.
CO2	Make use of laboratories/research organizations/project management consulting firms/QS and QA organizations/ planning
CO3	Take part in adequately to programs by professional bodies with industry exposures at sites/RMC plants
CO4	Appraise Internship /Professional Practice with due approvals
CO5	Outline the concept of avenues related to civil engineering domain and consultation process
Course Code	18 CVS 84
Course Title	TECHNICAL SEMINAR
CO1	Develop knowledge in the field of Civil Engineering and other disciplines through independent

	learning
CO2	Identify and discuss the current, real-time issues and challenges in engineering & technology
CO3	Develop written and oral communication skills
CO4	xplore concepts in larger diverse social and academic contexts.
CO5	Develop the skills to enable life-long learning.
	18 CV 83
	PROJECT WORK PHASE -2
CO1	Selection and initiation of individual projects and portfolios of projects
CO2	Illustrate project planning activities that accurately timelines, quality and implement processes
CO3	Demonstrate effective project execution and control techniques that result in successful projects
CO4	Outline project closure activities and obtain formal project acceptance.
CO5	Demonstrate a strong working knowledge of ethics and professional responsibility.

1 YEAR	SUB CODE: 15ELN15 / 25					SUB NAME: BASIC ELECTRONICS								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	1	2									1	1
CO2	3	3	1	2									1	1
CO3	3	3	2	1									1	2
CO4	3	3	1	1									1	2
CO5	3	3	2	1									3	1
Final_CO_one_row	3	3	1.4	1.4									1.4	1.4

3 Semester

3SEM	SUB CODE: 15MAT31 /17MAT31					SUB NAME:Engg. Mathematics - III								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1														
CO2														
CO3														
CO4														
CO5														
CO6														
Final_CO_one_row	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

3SEM	SUB CODE: 15EC32 /17EC32			MSO		SUB NAME: ANALOG ELECTRONICS								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1										1	1	
CO2	3	3	3									1	3	
CO3	2	2		1								1	1	
CO4	3	3	2									1	1	
CO5	2	1	3	1								1	3	
CO6														
Final_CO	2.4	2	2.666666667	1	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	1.8	#DIV/0!

3SEM	SUB CODE: 15EC33 /17EC34			GY		SUB NAME: DIGITAL ELECTRONICS								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1											1	2	
CO2		2	1	1								1	2	
CO3	2											1	2	
CO4		2	1	1								1	2	
CO5		2	2	2								1	2	
CO6														
Final_CO	1.5	2	1.333333333	1.333333333	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	2	#DIV/0!

3SEM	SUB CODE: 15EC34 /17EC35			MAS		SUB NAME: NETWORK ANALYSIS								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	2										2	
CO2	2	2	2										2	
CO3	2	2	2										2	
CO4	2	2	2										2	
CO5	2	2	2										2	
Final_CO	2	1.8	2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2	#DIV/0!

3SEM	SUB CODE: 15EC35 / 17EC35					SUB NAME: ELECTRONIC INSTRUMENTATION								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1														
CO2														
CO3														
CO4														
CO5														
Final_CO	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!									#DIV/0!	#DIV/0!

3SEM	SUB CODE: 15EC36 /17EC36			SMN		SUB NAME: ENGINEERING ELECTROMAGNETICS								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3									1	1	
CO2	3	2	3									1	2	
CO3	3	2	1									1	2	
CO4	3	1										1	1	
CO5														
CO6														
Final_CO	3	1.75	2.333333333	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	1.5	#DIV/0!

3 SEM	SUB CODE: 15ECL37 /17ECL37			MSO		SUB NAME: ANALOG ELECTRONICS LAB								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2					1			1			1	1	
CO2	3	1				1			1			1	1	
CO3	2	1				1			1			1	1	
CO4	3	1				1			1			1	1	
CO5	2					1			1			1	1	
CO6	2	1				1			1			1	1	
Final_CO	2.333333333	1	#DIV/0!	#DIV/0!	#DIV/0!	1	#DIV/0!	#DIV/0!	1	#DIV/0!	#DIV/0!	1	#REF!	#DIV/0!

3 SEM	SUB CODE: 15ECL38 /17ECL38			GS		SUB NAME: DIGITAL ELECTRONICS LAB								
	PO1	PO2	PO3no	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	3	2									3	
CO2	2	2	3	2									3	

CO3		2		2	2								3	
CO4		2	2	1									3	
CO5		2	2	2	2	3							3	3
CO6														
Final_CO		2	2	2.2	2	3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	3	3

4 Semester

4SEM SUB CODE: 15MAT41 /17MAT41 SUB NAME:Engg. Mathematics - IV

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Final_CO		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

4 SEM SUB CODE: 15EC42 /17EC46 BSU SUB NAME: MICROPROCESSOR

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	2										1	1	
CO2			2											1	
CO3				2										1	
CO4		2	2	2										2	
CO5				2									1	1	
CO6															
Final_CO		2.833	2.5	2.33	1.5	0.833	0	0	0	0			0.5	1.2	#DIV/0!

4 SEM SUB CODE: 15EC43 /17EC43 MAS SUB NAME: CONTROL SYSTEMS

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1												1	
CO2		2	2											1	
CO3		1	2		1									1	
CO4		1	2		1									1	
CO5		1			1									1	
CO6															
Final_CO		1.2	2	#DIV/0!	1	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	#DIV/0!

4 SEM SUB CODE: 15EC44 /17EC44 SD SUB NAME: SIGNALS & SYSTEMS

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		3	1	-										1	
CO2		2	2	1										2	
CO3		1	2	1										2	
CO4		1	2	2										2	
CO5		1	2	2										2	
CO6															
Final_CO		3	1.8	1.5	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.8	#DIV/0!

4 SEM SUB CODE: 15EC45 /17EC45 VK SUB NAME: PRINCIPLES OF COMMUNICATION SYSTEMS

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	1										1		
CO2		2	1										1		
CO3		2	2	1									1		
CO4		2	2										1		
CO5		2	1	1									1		
Final_CO_one_row		2	1.4	1	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	#DIV/0!	#DIV/0!

4 SEM SUB CODE: 15EC46 /17EC46 LC SUB NAME: LINEAR INTEGRATED CIRCUITS

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		3	2	2									1	1	
CO2		2	2	1									1	1	
CO3		2	2	1									1	1	
CO4		2	2	1									1	1	
CO5		2	2	2									1	1	
Final_CO_one_row		2.2	2	1.4	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	1	#DIV/0!

4 SEM SUB CODE: 15ECL47 /17ECL47 IJM SUB NAME: Microprocessor Lab

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1	1	2		2								2	
CO2		2	1	2		2								2	
CO3			1	2		2								2	
CO4		1	1	2		2								2	
CO5		2	2	2		2								2	
CO6															
Final_CO_one_row		3	3	1.5	1.5	1								2	#DIV/0!

4 SEM SUB CODE: 15ECL48 /17ECL48 NK SUB NAME: Linear ICs and Communication Lab

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	2	2										2	
CO2		2	2											2	
CO3		2	2											2	

CO4		2	2											2	
CO5		2				3								2	
Final_CO_one_row		2	2	2	#DIV/0!	3	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2	#DIV/0!

5 Semester

5 SEM SUB CODE: 15ES51 /17ES51 NKS SUB NAME: M & ED

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1							1		2	2	2		2		
CO2							1		2	2	2		2		
CO3							1		2	2	2		2		
CO4							1		2	2	2		2		
CO5							1		3	2	2	2	2		
Final_CO_one_row		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	#DIV/0!	2.2	2	2	2	2	#DIV/0!	#DIV/0!

5 SEM SUB CODE: 15EC52 / /17EC52 SMB SUB NAME: DSP

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		3	2	-	1	-	-	-	-	-	-	-	-	-	-
CO2		2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO3		2	2	1	-	-	-	-	-	-	-	-	-	1	-
CO4		2	2	2	1	-	-	-	-	-	-	-	-	3	-
CO5		-	-	1	-	-	-	-	-	-	-	-	-	2	-
Final_CO_one_row		2.25	1.75	1.33333333	1	-	-	-	-	-	-	-	-	2	-

5 SEM SUB CODE: 15EC53 /17EC53 MNV SUB NAME: VERILOG HDL

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1											1	2	
CO2		1				2							1		2
CO3		1	1			2							1	2	2
CO4		1	1			2							1	2	2
CO5		1											1	1	
Final_CO_one_row		1	1	#DIV/0!	#DIV/0!	2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	1.75	2

5 SEM SUB CODE: 15EC54 /17EC54 VKS SUB NAME: ITC

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		3	3											1	
CO2		3	3	2	1									3	
CO3		3	3	2	1									3	
CO4		3	2	2										2	
CO5		2	2	2	2									3	
CO6															
Final_CO_one_row		2.8	2.6	2	1.333333333	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.4	#DIV/0!

5 SEM SUB CODE: 15EC553 / /17EC553 CJ SUB NAME: OS

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Final_CO_one_row		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

5 SEM SUB CODE: 15EC555 /17EC555 ARK SUB NAME: MSP 430

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1	1										1	1	2
CO2		1	1			2							1	1	2
CO3		1	1			2							1	1	2
CO4		1	1										1	2	2
CO5		1	1			2							1	2	2
CO6															
Final_CO_one_row		1	1	#DIV/0!	#DIV/0!	2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	1.4	2

5 SEM SUB CODE: 15CS561 / 17CS561 SUB NAME: Programming in Java

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1				3		3						2	3		2
CO2				3		3						2	3		2
CO3				3		3						2	3		2
CO4				3		3				1		2	3		2
CO5				3		3						2	3		2
Final_CO		#DIV/0!	#DIV/0!	3	#DIV/0!	3	#DIV/0!	#DIV/0!	#DIV/0!	1	#DIV/0!	2	3	#DIV/0!	2

5 SEM SUB CODE: 15EC562 /17EC562 SUB NAME: OOP C++

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1															
CO2															

CO3															
CO4															
CO5															
CO6															
Final_CO one_row		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

5 SEM SUB CODE: 15EC563 /17EC563 SUB NAME: 8051 MICROCONTROLLER

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Final_CO one_row		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

5 SEM SUB CODE: 15ECL57 /17ECL57 PT SUB NAME: DSP Lab

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1				1									1
CO2		1				1									1
CO3		1				2									1
CO4		1				2							1		1
CO5															
Final_CO one_row		1	#DIV/0!	#DIV/0!	#DIV/0!	1.5	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	#DIV/0!	1

5 SEM SUB CODE: 15ECL58 /17ECL58 MNV SUB NAME: Verilog HDL Lab

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2				2								1	2
CO2		2	1			2								1	2
CO3		2	1			2								1	2
CO4		2	1		1	2							1	1	2
CO5															
CO6															
Final_CO _one_row		2	1	#DIV/0!	1	2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	1	2

6 Semester

6 SEM SUB CODE: 15EC61 /17EC61 CNP SUB NAME: Digital Communication

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Po9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	1											2	
CO2		3	1											2	
CO3		2												2	
CO4		2	2	1	1									2	
CO5		1	1											2	
CO6															
Final_CO _one_row		2	1.25	1	1	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2	#DIV/0!

6 SEM SUB CODE: 15EC62 /17EC62 GG SUB NAME: ARM & ES

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1											1	2	
CO2		1	2			2							1		2
CO3		1		1			1						1	2	
CO4		1	1	1									1		
CO5		1	1	1									1		
Final_CO one_row		1	1.333333333	1	#DIV/0!	2	1	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	2	2

6 SEM SUB CODE: 15EC63 /17EC63 SBG SUB NAME: VLSI DESIGN

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2				2							1	1	2
CO2		2	1			1							1	1	1
CO3		1	2										1	1	
CO4		2	1										1	1	
CO5		2	1										1	1	
CO6															
Final_CO one_row		1.8	1.25	#DIV/0!	#DIV/0!	1.5	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	1	1.5

6 SEM SUB CODE: 15EC64 /17EC64 SB SUB NAME: CCN

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1	1										1	1	
CO2		2	3										1	1	
CO3		2	1										1	1	
CO4		2	2	2									1	2	
CO5		2	2	2									1	2	
Final_CO one_row		1.8	1.8	2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	1.4	#DIV/0!

6 SEM SUB CODE: 15EC653 / /17EC653 LC SUB NAME: ANN

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2				1			1				1	1	

CO2		1	1			1			1				1	2	
CO3		1	1										1	1	
CO4		1	1										1	1	
CO5		1	1										1	1	
CO6															
Final_CO_one_row		1.2	1			1							1	1.2	#DIV/0!

6 SEM SUB CODE: 15EC654 / /17EC654 ANH SUB NAME: DSS

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	1											2	
CO2		2	1											2	
CO3		2	1	2	2									2	
CO4		2												2	
CO5		2												2	
CO6														2	
Final_CO_one_row		2	1	2	2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2	#DIV/0!

6 SEM SUB CODE: 15EC655 /17EC655 MR SUB NAME: MICROELECTRONICS

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	1										1	1	
CO2		2	2	3									1	2	
CO3		2	3										1	2	
CO4		1	3	2									1	2	
CO5		2	2	3									1	2	
CO6															
Final_CO_one_row		1.8	2.2	2.666666667	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	1.8	#DIV/0!

6 SEM SUB CODE: 15EC661 /17EC661 SUB NAME: DS C++

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Final_CO_one_row		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

6 SEM SUB CODE: 15CS664 SUB NAME: PYTHON APPLICATION PROGRAMMING

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1				3		3						2	3		2
CO2				3		3						2	3		2
CO3				3		3						2	3		2
CO4				3		3						2	3		2
CO5				3		3				1		2	3		2
Final_CO_one_row		#DIV/0!	#DIV/0!	3	#DIV/0!	3	#DIV/0!	#DIV/0!	#DIV/0!	1	#DIV/0!	2	3	#DIV/0!	2

6 SEM SUB CODE: 15ECL67 /17ECL67 GS SUB NAME: Embedded Controller Lab

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1	1			1							1	1	
CO2			1			1									3
CO3			1	1										2	2
CO4				1	2	1								2	2
CO5		1	1	1	2	1								2	2
Final_CO_one_row		1	1	1	2	1	#DIV/0!	2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	1.75	2.25

6 SEM SUB CODE: 15ECL68 /17ECL68 ARK SUB NAME: Computer Networks Lab

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	1			3					1		1		2
CO2		2	1			2					1		1		2
CO3		2	2			2					1		1	1	2
CO4		1	1			1					1		1		2
CO5		1	2			2					1		1	1	2
Final_CO_one_row		1.6	1.4	#DIV/0!	#DIV/0!	2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	#DIV/0!	1	2	2

7 Semester

7 SEM SUB CODE: 15EC71 /17EC71 CNP SUB NAME: MICROWAVE & ANTENNAS

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1												1	
CO2			1											1	
CO3		1	2											1	
CO4		2												1	
CO5			2											1	
CO6															
Final_CO_one_row		1.333333333	1.666666667	#DIV/0!										1	#DIV/0!

7 SEM SUB CODE: 15EC72 /17EC72 SD SUB NAME: DIP

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		3												3	
CO2			2	1										2	
CO3			2	2										2	
CO4		1	2	2	1									2	
CO5			2	2	1									2	
CO6															
Final_CO one_row		2	2	1.75	1	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.2	#DIV/0!

7 SEM SUB CODE: 15EC73 /17EC73 SNS SUB NAME: PE

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		3	1										1	1	
CO2		3	2										1	2	
CO3		2	1										1	1	
CO4		2	2										1	1	
CO5		2	1										1	1	
CO6															
Final_CO _one_row		2.4	1.4	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	1.2	#DIV/0!

7 SEM SUB CODE: 15EC741 /17EC741 MAS SUB NAME: MMC

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	1	1										1	
CO2		2	2	2										2	
CO3		2	2	2										2	
CO4		2	2	1										1	
CO5		2	2	2										2	
CO6															
Final_CO one_row		2	1.8	1.6	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.6	#DIV/0!

7 SEM SUB CODE: 15EC743 /17EC743 BSU SUB NAME: RTS

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		3	1											1	
CO2		2	1	1										1	
CO3		1	2	2										2	
CO4			2	2										2	
CO5			2	2										2	
Final_CO one_row		2	1.5	1.666666667	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.5	#DIV/0!

7 SEM SUB CODE: 15EC744 /17EC744 SVU SUB NAME: CRYPTOGRAPHY

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		3	3	1									1		
CO2		3	1										1		
CO3		3	3	2			1								
CO4		2	2											1	
CO5		2	3	1			1		1						
Final_CO one_row		2.6	2.4	1.333333333	#DIV/0!	#DIV/0!	1	#DIV/0!	1	#DIV/0!	#DIV/0!	#DIV/0!	1	1	#DIV/0!
														1	#DIV/0!

7 SEM SUB CODE: 15EC755 /17EC755 VHR SUB NAME: SAT COMMN

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	2	1	1									1	
CO2		2	2	1										1	
CO3		2	2	1										1	
CO4			1	1										1	
CO5				1										1	
CO6															
Final_CO one_row		2	1.75	1	1	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	#DIV/0!

7 SEM SUB CODE: 15ECL76 /17ECL76 NK SUB NAME: Advanced Communication Lab

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2		2										2	
CO2		2												2	
CO3		2												2	
CO4		2												2	
CO5		2				3								2	3
CO6															
Final_CO one_row		2	#DIV/0!	2	#DIV/0!	3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2	3

7 SEM SUB CODE: 15ECL77 /17ECL77 IJM SUB NAME: VLSI Lab

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1						2							1		2
CO2		2	1			3							1	1	3
CO3		2	1			3							1		3
CO4		2	1			3							1	1	3
CO5		2	1			3							1	1	3
CO6															
Final_CO one_row		2	1	#DIV/0!	#DIV/0!	2.8	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	1	2.8

7 SEM SUB CODE: 15ECP78 /17ECP78 BSU/ARK/SVU SUB NAME: Project Work

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Final_CO_one_row		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	**#DIV/0!**	**#DIV/0!**

8 semester

8 SEM SUB CODE: 15EC81 /17EC81 NKS SUB NAME: Wireless Cellular and LTE 4G Broadband

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	1										1	1	
CO2		3	1	1									1	1	
CO3		2	1											1	
CO4		2	1												
CO5		2	2	1										1	
Final_CO_one_row		2.2	1.2	1	#DIV/0!								1	**1**	**#DIV/0!**

8 SEM SUB CODE: 15EC82 /17EC82 SB SUB NAME: Fiber Optics and Networks

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1	1		1								1		
CO2		2	2		1								2		
CO3		2	2		1								2		
CO4		1	1		1								2		
CO5		1	1		1								1		
CO6															
Final_CO_one_row		1.4	1.4	#DIV/0!	1	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.6	**#DIV/0!**	**#DIV/0!**

8 SEM SUB CODE: 15EC831 /17EC831 SUB NAME: Micro Electro Mechanical Systems

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Final_CO_one_row		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	**#DIV/0!**	**#DIV/0!**

8 SEM SUB CODE: 15EC834 /17EC834 PT SUB NAME: Machine Learning

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1			1												
CO2		3	2	3											2
CO3			2	2	1										2
CO4			2	2	3										2
CO5			3	2	3										2
CO6															
Final_CO_one_row		3	2	2.25	2.333333333	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	**#DIV/0!**	**2**

8 SEM SUB CODE: 15EC835 /17EC835 VKS SUB NAME:Network and Cyber Security

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1	1	1									1	2	
CO2		1	2										1		
CO3		1	2							1					
CO4		1								1				2	
CO5		1	2	1						1				2	1
Final_CO_one_row		1	1.75	1	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	#DIV/0!	#DIV/0!	1	**2**	**1**

8 SEM SUB CODE: 15EC84 /17EC84 MAS SUB NAME: Internship Professional Practice

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2		2		2								2	
CO2											2		2		
CO3										3	3		2		
CO4				2		2					2				2
CO5		2									2				
Final_CO_one_row		2	#DIV/0!	2	#DIV/0!	2	#DIV/0!	#DIV/0!	#DIV/0!	3	2.25	#DIV/0!	2	2	2
														2	**2**

8 SEM SUB CODE: 15ECP85 /17ECP85 BSU/ARK/SVU SUB NAME: Project Work

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	3				2		2	3	2		1	2	
CO2		2								2	3			2	
CO3			3	2	2	2				3	3	2		2	
CO4									2	2	3				
CO5			2	2						3	3	3	2	2	3
CO6															
Final_CO		2	2.666666667	2	2	2	2	#DIV/0!	2	2.6	2.8	2.5	1.5	**2**	**3**

8 SEM SUB CODE: 15ECS86 /17ECS86 GY/DH/MSN SUB NAME: Seminar

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1	2		2									2	
CO2		1	1		1						3		2		
CO3									2		1		2		
CO4		2	2		2									1	
CO5										3	3		2		
CO6															
Final_CO		1.333333333	1.666666667	#DIV/0!	1.666666667	#DIV/0!	#DIV/0!	#DIV/0!	2	3	2.333333333	#DIV/0!	2	**1.5**	**#DIV/0!**

	SUB CODE: 15ELN15 / 25 /17ELN15/25	SUB NAME: BASIC ELECTRONICS
CO1	Gaining the knowledge of basics of diode and its applications in rectifiers, filter circuits, regulators, transistor configuration and biasing.	
CO2	Design simple circuits like amplifier, voltage follower, comparators, adders, integrator and differentiator using OPAMPS.	
CO3	Acquire knowledge in digital electronics with number system, combinational circuits and implement simple logic function using basic and universal gates.	
CO4	Intrepretation of sequential circuits and 8051 microcontroller and interfacing.	
CO5	Analyze the functioning of a communication systems and Transducers.	

3 Semester

3SEM	SUB CODE: 15MAT31 /17MAT31	SUB NAME:Engg. Mathematics - III
CO1		
CO2		
CO3		
CO4		
CO5		
CO6		

3SEM	SUB CODE: 15EC32 /17EC32	MSO	SUB NAME: ANALOG ELECTRONICS
CO1	Explain the operation, parameters and characteristics of BJTs and FETs		
CO2	Design and analyse different types of transistor biasing for voltage and power amplifier circuits		
CO3	Discuss and examine the low frequency and high frequency responses of BJT and FET amplifiers.		
CO4	Apply and distinguish the concept of feedback in amplifiers and oscillators		
CO5	Evaluate the efficiency for various power amplifiers and classify series and shunt voltage regulators.		
CO6			

3SEM	SUB CODE: 15EC33 /17EC34	GY	SUB NAME: DIGITAL ELECTRONICS
CO1	Apply the knowledge of simplification techniques to digital circuits.		
CO2	Design and Analysis of combinational circuits applications		
CO3	Explain the operation of Flip-Flops		
CO4	Design , Simplify and Analysis of sequential circuits using flip-flops		
CO5	Design and Analysis of sequential circuit applications		
CO6			

3SEM	SUB CODE: 15EC34 /17EC35	MAS	SUB NAME: NETWORK ANALYSIS
CO1	Apply basic circuit concepts like mesh analysis, node analysis, star-delta transformation etc. to determine circuit currents and voltages.		
CO2	Use the conclusions of network theorems to solve the network problems efficiently.		
CO3	Determine the initial conditions of the given network, represent the network using differential equations and solve them using Laplace Transform to find response.		
CO4	Determine the parameters that characterize series/parallel Resonant Circuits and two-port networks.		
CO5	Determine the parameters associated with discrete and IC amplifier circuits, time-delay generator circuits, digital logic circuits etc.		

3SEM	SUB CODE: 15EC35 / 17EC35	SUB NAME: ELECTRONIC INSTRUMENTATION
CO1		
CO2		
CO3		
CO4		
CO5		

3SEM	SUB CODE: 15EC36 /17EC36	SMN	SUB NAME: ENGINEERING ELECTROMAGNETICS
CO1	Acquire the knowledge of basic concepts of electric and magnetic fields		

CO2	Interpret the laws and theorems of electric and magnetic fields
CO3	Apply knowledge of fields on various electric and electronic systems
CO4	Understand the concept of wave propagation with the aid of Maxwell's equation
CO5	
CO6	

3 SEM **SUB CODE: 15ECL37 /17ECL37** **MSO** **SUB NAME: ANALOG ELECTRONICS LAB**

CO1	Design circuits for rectifiers, clippers , clampers and voltage regulators:
CO2	Study the characteristics of JFET and MOSFET devices and compute their parameters.
CO3	Design and analyse the BJT amplifiers in CE configuration for with and without feedback .
CO4	Design and determine the gain bandwidth product for JFET amplifier.
CO5	Setup and Study the Class-B power amplifier.
CO6	Design and Test various types of oscillators.1

3 SEM **SUB CODE: 15ECL38 /17ECL38** **GS** **SUB NAME: DIGITAL ELECTRONICS LAB**

CO1	Demonstrate the truth table of various expressions and combinational circuits using logic gates.
CO2	Design and test various combinational circuits such as adders, subtractors, comparators, multiplexers.
CO3	Realize Boolean expression using decoders.
CO4	Construct and test flips-flops, counters and shift registers.
CO5	Simulate full adder and up/down counters.
CO6	

4 Semester

4SEM **SUB CODE: 15MAT41 /17MAT41** **SUB NAME:Engg. Mathematics - IV**

CO1	
CO2	
CO3	
CO4	
CO5	
CO6	

4 SEM **SUB CODE: 15EC42 /17EC46** **BSU** **SUB NAME: MICROPROCESSOR**

CO1	Explain evolution of Microprocessors, 8086 architecture and pin diagram, bus configurations and timings
CO2	Illustrate detailed software structure of the Microprocessor.
CO3	Develop assembly level programs by using 8086 instruction set
CO4	Apply knowledge of 8086 architecture to Interface it with different peripherals
CO5	Develop models for practical applications
CO6	

4 SEM **SUB CODE: 15EC43 /17EC43** **MAS** **SUB NAME: CONTROL SYSTEMS**

CO1	To study fundamentals of control system and to define transfer function for mathematical modelling of systems.
CO2	Describe system performance using time response and its specifications.
CO3	To apply knowledge of transfer function to establish stability and its consequence for a system.
CO4	To interpret system stability in frequency domain.
CO5	To study and understand modern control theory.
CO6	

4 SEM **SUB CODE: 15EC44 /17EC44** **SD** **SUB NAME: SIGNALS & SYSTEMS**

CO1	Describe and classify signals and systems.

CO2	Determine the response of LTI systems and classify the same using impulse response.
CO3	Represent continuous time signals using Fourier series and Fourier transforms.
CO4	Analyze discrete time signals and systems using DTFT and Z – transforms.
CO5	Apply the properties of Fourier series , Fourier Transforms and Z- transforms.
CO6	

4 SEM **SUB CODE: 15EC45 /17EC45** **VK** **SUB NAME: PRINCIPLES OF COMMUNICATION SYSTEMS**

CO1	Represent analog signals in time domain as random processes and in frequency domain using Fourier transforms.
CO2	Discuss the performance of analog and pulse modulation schemes in time and frequency domains.
CO3	Examine various techniques for the generation and detection of amplitude, angle and pulse modulated signals and apply them in design of simple communication systems.
CO4	Analyze the influence of channel on analog modulated signals and compare the performance of various analog modulation schemes
CO5	Translate an analog signal to digital signal using various pulse modulation techniques.

4 SEM **SUB CODE: 15EC46 /17EC46** **LC** **SUB NAME: LINEAR INTEGRATED CIRCUITS**

CO1	Understanding the fundamentals of Op amps: The basic construction, ideal and practical operating parameters.
CO2	Design & Analyse circuits with op amps working as D.C and AC amplifiers using the basic configurations.
CO3	Use DC and A.C amplifiers for various applications.
CO4	Design and analyze variety of Linear applications of op amps.
CO5	Design and illustrate a variety of Non-Linear applications of opamps and understand the operation of IC voltage regulators.

4 SEM **SUB CODE: 15ECL47 /17ECL47** **IJM** **SUB NAME: Microprocessor Lab**

CO1	Make use of 8086 instruction set to write and execute assembly level programs to perform data transfer and arithmetic operations.
CO2	Apply knowledge of 8086 instruction set to perform Logical and string operations.
CO3	Utilize procedures and macros in programming of 8086.
CO4	Illustrate assembler directives, branch, loop operations and DOS 21H Interrupts
CO5	Develop ALPs to interface 8086 with peripheral devices
CO6	

4 SEM **SUB CODE: 15ECL48 /17ECL48** **NK** **SUB NAME: Linear ICs and Communication Lab**

CO1	Design and analyse various opamp applications -instrumentation amplifier , filters,DAC, adder, differentiator and integrator circuits
CO2	Design and generate waveforms gfor oscillators and multivibrators
CO3	Generation and detection of various analog modulation techniques
CO4	Construct and observe analog pulse modulation schemes
CO5	Demonstrate frequency synthesis using PLL

5 Semester

5 SEM **SUB CODE: 15ES51 /17ES51** **NKS** **SUB NAME: M & ED**

CO1	Explain the importance of Management and acquire basic managerial skills.
CO2	Analyze the nature, purpose & objectives of all the functions in management
CO3	Understand the types, characteristics of entrepreneurs and build entrepreneurial model.
CO4	Describe the role of modern SSIs, steps to start SSI and its importance in economic development.
CO5	Discuss the project management, product planning, project design and network analysis.

5 SEM **SUB CODE: 15EC52 / /17EC52** **SMB** **SUB NAME: DSP**

CO1 Perform frequency domain sampling and reconstruction of discrete time signals, Compute DFT/IDFT of any given sequence.
CO2 Apply the properties of DFT and use the DFT in Linear Filtering.
CO3 Compute DFT efficiently using FFT algorithms, Chirp-Z Transform and Goertzel algorithm.
CO4 Design IIR and FIR filters.
CO5 Realize IIR and FIR filter structures.

5 SEM SUB CODE: 15EC53 /17EC53 MNV SUB NAME: VERILOG HDL

CO1 Acquiring knowledge on digital design and different modeling concepts of Verilog HDL
CO2 Understanding the syntax and analyzing structure of a verilog program.
CO3 Designing digital circuits using gate level and data flow modeling with suitable test bench
CO4 Designing digital circuits using behavioral style of programming with suitable test bench
CO5 Acquire the knowledge on basics of VHDL and comparing VHDL with Verilog

5 SEM SUB CODE: 15EC54 /17EC54 VKS SUB NAME: ITC

CO1 Explain and apply the concepts of Entropy, Rate of Information and Order of a source with respect to Dependent & Independent Source.
CO2 Represent the information using Shannon ,Shannon Fano, Huffman, Arithmetic, LZ, Encoding Algorithms and construct tables for the output of a source.
CO3 Model the continuous and discrete communication channels using input, output and joint probabilities
CO4 Compute a codeword using Linear Block , cyclic & convolutional coding techniques for error detection and correction
CO5 Design the encoding and decoding circuits for Linear Block codes, cyclic codes, convolutional codes, BCH and Golay codes.

5 SEM SUB CODE: 15EC553 / /17EC553 CJ SUB NAME: OS

CO1 Explain the goals, structure, operation and types of operating systems.
CO2 Understand the concept of Process, importance of computer system resources, Memory management
CO3 Analyse the scheduling of processes by CPU and implementation of Memory management policies and virtual memory.
CO4 Understand the structure of file system, Interprocess communication and deadloack circumstances
CO5 Illustrate the interface between File system and IOCS, File access algorithm,deadlock detection and prevention methods.

5 SEM SUB CODE: 15EC555 /17EC555 ARK SUB NAME: MSP 430

CO1 Understand the architectural features and instruction set of 16 bit microcontroller MSP430.
CO2 Develop assembly programs using the various instructions of MSP430 for different applications
CO3 Understand the functions of the various on chip peripherals in MSP430 microcontroller and develop small applications.
CO4 Analyze the power saving modes and interrupts in MSP430.
CO5 Analysing different communication protocols present in MSP430 and developing some simple applications to interface LEDs and switches

5 SEM SUB CODE: 15CS561/ 17CS561 SUB NAME :JAVA

CO1 Describe the concepts of OOP
CO2 Analyze Java Programs using operators and iterators
CO3 Interpret the concepts of Classes and Objects
CO4 Design Java Programs to solve real world applications using packages and interfaces

CO5	Create applications related to Strings and Enumerations

5 SEM	**SUB CODE: 15EC562 /17EC562**		**SUB NAME: OOP C++**
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

5 SEM	**SUB CODE: 15EC563 /17EC563**		**SUB NAME: 8051 MICROCONTROLLER**
CO1	Explain the internal structure of microcontroller.		
CO2	Illustrate the operations of internal peripherals		
CO3	Write Assembly level programs using instruction set.		
CO4	Develop Assembly and C language programs for on-chip peripherals.		
CO5	Demonstrate the interfacing of external peripheral to microcontroller.		

5 SEM	**SUB CODE: 15ECL57 /17ECL57**	**PT**	**SUB NAME: DSP Lab**
CO1	Realize various signal processing operations using MATLAB tool.		
CO2	Design and test IIR and FIR filters using MATLAB tool.		
CO3	Implement signal processing operations using CCStudio and DSK (with DSP processor TMS320C6713).		
CO4	Implement and test real-time FIR filter using CCStudio and DSK (with DSP processor TMS320C6713).		
CO5			

5 SEM	**SUB CODE: 15ECL58 /17ECL58**	**MNV**	**SUB NAME: Verilog HDL Lab**
CO1	Design, simulate and synthesize combinational circuits. Verify the code using test bench and FPGA.		
CO2	Design, simulate and synthesize sequential circuits. Verify the code using test bench and FPGA		
CO3	Design, simulate and synthesize the circuit in all three design styles using HDL. Verify the code using test bench and FPGA		
CO4	Design and synthesize HDL program to interface various hardware circuits.		
CO5			
CO6			

6 Semester

6 SEM	**SUB CODE: 15EC61 /17EC61**	**CNP**	**SUB NAME: Digital Communication**
CO1	Analyze baseband and bandpass signals in time and frequency domain.		
CO2	Apply the knowledge of statistical theory of communication and explain the conventional digital communication system.		
CO3	Analyze the channel characteristics in noisy environment.		
CO4	Evaluate and analyze the performance of receiver in digital communication system		
CO5	Describe the digital communication system with spread spectrum modulation techniques		

6 SEM	**SUB CODE: 15EC62 /17EC62**	**GG**	**SUB NAME: ARM & ES**
CO1	Describe the architectural features and instructions of 32 bit microcontroller ARM Cortex M3.		

CO2	Apply the knowledge gained for programming ARM Cortex M3 for different applications.
CO3	Analyze the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.
CO4	Prepare the hardware /software co-design and firmware design approaches.
CO5	Understand the architecture and applications of OS used for Embedded System.

6 SEM **SUB CODE: 15EC63 /17EC63** **SBG** **SUB NAME: VLSI DESIGN**

CO1	Understand the concepts of MOS device, circuit & system aspects of digital IC design
CO2	Apply the Lambda based design rules for MOS circuits and subsystem design
CO3	Analyze the functionality and Architectural issues of system design processes
CO4	Analyze the Performance Parameters of Digital IC circuits
CO5	Understand the Memory aspects and Testing principles for the various design process
CO6	

6 SEM **SUB CODE: 15EC64 /17EC64** **SB** **SUB NAME: CCN**

CO1	Describe the layering architecture of computer networks and distinguish between the OSI model and TCP/IP protocol suite.
CO2	Discuss and analyze the protocols and services of Data link layer.
CO3	Distinguish the basic network configurations and standards of wired and wireless LANs.
CO4	Configuring IPv4 addresses for networks and determine the routing of packets using different routing algorithms.
CO5	Analyse the protocols and functions associated with the transport layer services.

6 SEM **SUB CODE: 15EC653 / /17EC653** **LC** **SUB NAME: ANN**

CO1	Understand the basics of ANN and comparison with Human brain
CO2	Discuss Algorithms for Supervised and Unsupervised Learning
CO3	Explain Generalization and Regularization for function approximation and discuss Support Vector Machines, Radial Bias Functions
CO4	Discuss and examine Associative and Competitive learning models
CO5	Explain Feature extraction and concept of Self organizing Feature Maps
CO6	

6 SEM **SUB CODE: 15EC654 / /17EC654** **ANH** **SUB NAME: DSS**

CO1	Discuss the knowledge of telecommunication networks, services, standards along with various digital transmission methods.
CO2	Explain the techniques of analog and digital switching.
CO3	Analyze the concepts of telecommunication traffic along with mathematical model of switching system.
CO4	Distinguish the different digital switching system involving System software
CO5	IIlustrate the basic requirements for modeling and maintenance of DSS

6 SEM **SUB CODE: 15EC655 /17EC655** **MR** **SUB NAME: MICROELECTRONICS**

CO1	Describe the physics and principles of operation of MOSFETS and VI characterstics
CO2	Apply circuit models of MOSFETS in the design of discrete and single stage MOS IC amplifiers including Active Loaded Amplifiers.
CO3	Analyze and Design microelectronic circuits for linear amplifiers and digital applications..
CO4	Current sources, Current steering circuits and analyze the HF response of Discrete and Direct-coupled MOS IC amplifiers.
CO5	Compare single stage, differential and multistage amplifiers, and determine performance parameters of these amplifiers.
CO6	

6 SEM **SUB CODE: 15EC661 /17EC661** **SUB NAME: DS C++**

CO1	Understand fundamentals of data structures, dynaic allocation and linear representation of data structures.

CO2 Analyze linear data structures like Arrays and Matrices
CO3 Apply the linear data structures like stack and queues in programming.
CO4 Implement the Hashing techniques and tree data structures in problem solving.
CO5 Select appropriate data structure during application development.
CO6

6 SEM SUB CODE: 15CS664 /17CS664 SUB NAME: PYTHON APPLICATION PROGRAMMING

CO1 Describe Python syntax and semantics and be fluent in the use of Python flow control and functions.
CO2 Analyze proficiency in handling Strings and File Systems.
CO3 Develop Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
CO4 Interpret the concepts of Object-Oriented Programming as used in Python.
CO5 Create applications related to Network Programming, Web Services and Databases in Python.

6 SEM SUB CODE: 15ECL67 /17ECL67 GS SUB NAME: Embedded Controller Lab

CO1 Discuss instruction set of 32-bit microcontroller ARM processor (Cortex M3) LPC1768 and the software tool (Keil)required for programming in assembly and C language uage
CO2 Develop assembly language programs using ARM controller for different applications
CO3 Illustratei Interfacing of external devices and I/O with ARM Cortex M3
CO4 Prepare C language programs and creation / usage of library functions for embedded system applications
CO5 Analyzing the functions of various peripherals, peripheral registers and power saving modes of ARM Cortex M3

6 SEM SUB CODE: 15ECL68 /17ECL68 ARK SUB NAME: Computer Networks Lab

CO1 **Utilize the network simulators like NS3 and NCTUns for building different network topologies**
CO2 **Configure network elements like nodes, switches, bridges ,routers to build different types of networks.**
CO3 **Simulate networks with different configurations and measure the performance parameters.**
CO4 **Realize the operations of datalink layer protocols and algorithms using C programming.**
CO5 **Implement the routing and transport layer protocols using C programming. (L1,L2,L3)**

7 Semester

7 SEM SUB CODE: 15EC71 /17EC71 CNP SUB NAME: MICROWAVE & ANTENNAS

CO1 Explain the use and advantages of microwave transmission
CO2 Identify the various microwave devices and types of striplines
CO3 Analyze various microwave parameters related to microwave transmission lines and waveguides
CO4 Define and interpret the antenna parameters
CO5 Classify antenna types and analyse their radiation patterns
CO6

7 SEM SUB CODE: 15EC72 /17EC72 SD SUB NAME: DIP

CO1 Explain fundamental concepts of digital image processing systems
CO2 Identify various techniques for improving image quality in spatial domain
CO3 Determine and analyze frequency domain representation of images for quality improvement
CO4 Examine various techniques for segmentation, image analysis and recognition.
CO5 Illustrate image processing algorithms for practical applications
CO6

7 SEM **SUB CODE: 15EC73 /17EC73** **SNS** **SUB NAME: PE**

CO1	Understand as well as explain construction and operation of various power devices.
CO2	Analyze the working of various power and triggering circuits and protection circuits
CO3	Determine the performance parameters of various power circuits and thier application in rectifiers, converters and inverters
CO4	Sketch and examine the response of various power circuits under different load conditions
CO5	Illustrate the operation of converters, inverters and static switches
CO6	

7 SEM **SUB CODE: 15EC741 /17EC741** **MAS** **SUB NAME: MMC**

CO1	Discuss the basics of different multimedia networks and applications.		
CO2	Explain digitization principle techniques required to analyze different media types.		
CO3	Examine compression techniques required to compress text, image, audio and video signals		
CO4	Discuss multimedia data communication across different networks.		
CO5	Illustration of compression techniques for multimedia data types		
CO6			

7 SEM **SUB CODE: 15EC743 /17EC743** **BSU** **SUB NAME: RTS**

CO1	Explain the fundamentals of Real time systems, its classifications and Concepts of Computer Control.
CO2	Discuss the concepts of operating system, suitable computer hardware requirements and interfaces for real-time applications.
CO3	Learn to use various software languages for Real time applications
CO4	Examine scheduling concepts, task and memory management and apply suitable methodologies to design, develop Real-Time Systems
CO5	Assess different Case studies of RTS Development Methodologies

7 SEM **SUB CODE: 15EC744 /17EC744** **SVU** **SUB NAME: CRYPTOGRAPHY**

CO1	Illustrate the concepts of number theory and fields and apply them for various cryptographic algorithms
CO2	Encrypt and decrypt the data using Symmetric and Asymmetric classical cryptographic algorithms
CO3	Examine the use of Symmetric and Asymmetric modern block cryptographic algorithms to encrypt and decrypt the data
CO4	Generate pseudorandom number generators and stream ciphers required for cryptographic applications
CO5	Provide authentication and protection for encrypted data.

7 SEM **SUB CODE: 15EC755 /17EC755** **VHR** **SUB NAME: SAT COMMN**

CO1	Define the basic principles of satellite orbits and trajectories.
CO2	Discuss the electronic systems associated with a satellite and the earth station.
CO3	Describe the various technologies associated with the satellite communication.
CO4	Explain the communication satellite and the national satellite system and other domain services
CO5	Describe the role of earth stations and ground systems for satellite applications

7 SEM **SUB CODE: 15ECL76 /17ECL76** **NK** **SUB NAME: Advanced Communication Lab**

CO1	To design and perform various degital modulation techniques like PDM ASK FSK and PSK
CO2	To determine the charecteristics of microstrip devices and compute the parameters associated with it.
CO3	To determine the charecteristics and response of microwave devices
CO4	to study the basic principles of optical communication systems.
CO5	simulate and show the waveforms of digital communication systems.

7 SEM	SUB CODE: 15ECL77 /17ECL77	IJM	SUB NAME: VLSI Lab
CO1	Understand the flow of the Full Custom IC design cycle by exploring the CAD tool.		
CO2	Apply the knowledge of programming to design, simulate and synthesize various digital circuits.		
CO3	Analyze and design the defined parameters in analog circuits.		
CO4	Analyze and verify the functionality of the basic amplifier circuits.		
CO5	Construct and verify the amplifier applications to meet desired parameters using basic amplifiers.		
CO6			

7 SEM	SUB CODE: 15ECP78 /17ECP78	BSU/ARK/SVU	SUB NAME: Project Work
CO1			
CO2			
CO3			
CO4			
CO5			
CO6			

8 Semester

8 SEM	SUB CODE: 15EC81 /17EC81	NKS	SUB NAME: Wireless Cellular and LTE 4G Broadband
CO1	Explain the system architecture and functional standard specified in LTE 4G.		
CO2	Comprehend the modulation techniques for LTE communication system and describe the concepts of fading in broadband wireless channel.		
CO3	Define and classify the channel structure of LTE for uplink and downlink.		
CO4	Discuss the different scheduling formats, physical layer procedures and basic multiple antenna techniques.		
CO5	Outline the EPS handling processes from setup to release including mobility management, resource management and packet data processing procedures.		

8 SEM	SUB CODE: 15EC82 /17EC82	SB	SUB NAME: Fiber Optics and Networks
CO1	Elaborate on the principle of operation, structure, modes and parameters of optical fiber.		
CO2	Estimate attenuation and distortion in optic fiber caused by various phenomena during signal propagation.		
CO3	Distinguish between optical sources & detectors and Illustrate different stages of optical receiver.		
CO4	Discuss the construction and working principle of various optical devices needed like connectors, multiplexers and amplifiers in Fiber optics.		
CO5	Define networking aspects of optical fiber and describe various networking standards associated with it.		
CO6			

8 SEM	SUB CODE: 15EC831 /17EC831	SUB NAME: Micro Electro Mechanical Systems
CO1		
CO2		
CO3		
CO4		
CO5		
CO6		

8 SEM	SUB CODE: 15EC834 /17EC834	PT	SUB NAME: Machine Learning
CO1	Understand what is Machine learning and its use in the design of intelligent machines.		
CO2	Apply the underlying mathematical relationships within and across Machine Learning algorithms.		
CO3	Explain paradigms of supervised and un-supervised learning.		
CO4	Have a good understanding of the problems that arise when dealing with very small and very big datasets, and how to solve them.		
CO5	Recognize a real world problem and apply the learned techniques of Machine Learning to solve the problem.		

CO6

8 SEM SUB CODE: 15EC835 /17EC835 VKS SUB NAME:Network and Cyber Security

CO1 Explain network security protocols in the Application ,Transport and Application layer
CO2 Understand the basic concepts of cyber security
CO3 Discuss the cyber security problems
CO4 Explain the enterprise security framework.
CO5 Apply concept of cyber security framework in computer system

8 SEM SUB CODE: 15EC84 /17EC84 MAS SUB NAME: Internship Professional Practice

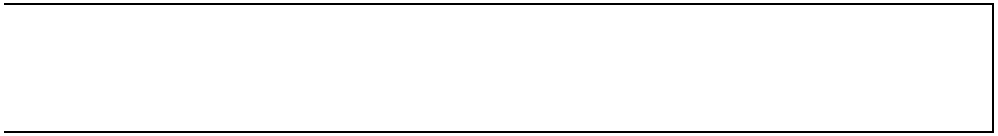
CO1 Integrate theory and practice.
CO2 Develop communication,interpersonal,and other critical skills.
CO3 Practice the qualities of professional writing skillsand to understand how to apply technical information and knowledge in practical documents.
CO4 Able to practice acquired knowledge within the chosen area of technology for project development.
CO5 Assess interests and abilities in their field of study.

8 SEM SUB CODE: 15ECP85 /17ECP85 BSU/ARK/SVU SUB NAME: Project Work

CO1 Able to identify and formulate a problem statement through extensive literature surveyon contemporary issue with ethics and time management
CO2 Devise engineering solutions for proposed project using a systematic approach
CO3 Apply engineering knowledege to design and develop the project
CO4 Exhibit written and oral communication , interpersonal skills
CO5 Demonstrate, present and defend the project work to a panel of experts
CO6

8 SEM SUB CODE: 15ECS86 /17ECS86 GY/DH/MSN SUB NAME: Seminar

CO1 Analyse current topics in electronic circuits, communication systems and related areas based on current publications
CO2 Develop communications skill by making oral presentation before evaluation committee
CO3 Develop sense of discipline and ethics
CO4 Apply fundamental principles , generalizations or theories of basic engineering and mathematics
CO5 Practice the qualities of professional writing skills and to understand how to apply technical information and knowledge in practical document
CO6



	SUB CODE: 18ELN15 / 25	SUB NAME: BASIC ELECTRONICS
CO1	Gaining the knowledge of basics of diode and its applications in rectifiers, filter circuits, regulators, transistor configuration and biasing.	
CO2	Design simple circuits like amplifier, voltage follower, comparators, adders, integrator and differentiator using OPAMPS.	
CO3	Acquire knowledge in digital electronics with number system, combinational circuits and implement simple logic function using basic and universal gates.	
CO4	Intrepretation of sequential circuits and 8051 microcontroller and interfacing.	
CO5	Analyze the functioning of a communication systems and Transducers.	

3 Semester

3SEM	SUB CODE: 18MAT31	SUB NAME:Engg. Mathematics - III
CO1		
CO2		
CO3		
CO4		
CO5		
CO6		

3SEM	SUB CODE: 18EC32	SUB NAME: Network Theory
CO1	Apply basic circuit concepts like mesh analysis, node analysis, star-delta transformation etc. to determine circuit currents and voltages.	
CO2	Use the conclusions of network theorems to solve the network problems efficiently.	
CO3	Determine the initial conditions of the given network, represent the network using differential equations and solve them using Laplace Transform to find response.	
CO4	Determine the parameters that characterize series/parallel Resonant Circuits and two-port networks.	
CO5	Determine the parameters associated with discrete and IC amplifier circuits, time-delay generator circuits, digital logic circuits etc.	
CO6		

3SEM	SUB CODE: 18EC33	SUB NAME: Electronic Devices
CO1	Define the principles of semiconductor physics	
CO2	Differentiate between the principles and characteristics of different types of semiconductor devices	
CO3	Understand and describe the fabrication process of semiconductor devices	
CO4	Identify the mathematical models of semiconductor junctions for circuits and systems	
CO5	Analyse the mathematical models of MOS transistors for circuits and systems	

3SEM	SUB CODE: 18EC34	SUB NAME: Digital System Design
CO1	Apply the knowledge of simplification techniques to digital circuits.	
CO2	Design and Analysis of combinational circuits applications	
CO3	Explain the operation of Flip-Flops	
CO4	Design, Simplify and Analysis of sequential circuits using flip-flops	
CO5	Design and Analysis of sequential circuit applications	

3SEM	**SUB CODE: 18EC35**	**SUB NAME: Computer Organization & Architecture**
CO1	Visualize the basic building blocks of computer and basic instructions.	
CO2	Analyze the instruction formats and programs as sequence of machine instructions	
CO3	Explore different ways of accessing I/O devices, interrupts, DMA.	
CO4	Design and evaluate the performance of different types of semiconductor and secondary storage memories.	
CO5	Analyze the basic functional units of processor	

3SEM	**SUB CODE: 18EC36**	**SUB NAME: Power Electronics & Instrumentation**
CO1	Explain & test the circuits using power electronic devices like SCR	
CO2	Analyze various controlled rectifiers, converters, inverters & SMPS	
CO3	Classify instrument errors & design the circuit for digital multirange voltmeters, ammeters & multimeters	
CO4	Categorize different types of bridges & transducers & its applications	
CO5	Describe the principle of operation of digital instruments & PLCs	
CO6		

3 SEM	**SUB CODE: 18ECL37**	**SUB NAME: Electronic Devices & Instrumentation Laboratory**
CO1	Design and generate waveforms to understand clipping, clamping, rectification and voltage regulation	
CO2	Device experiments to know the characteristics of LDR, Photodiode and SCR	
CO3	Construct application circuit for firing of SCR	
CO4	Demonstrate temperature measurement using temperature sensor bridge and resistance measurement using wheatstone's and kelvin's bridge.	
CO5	Model and simulate various semiconductor device characteristics and their applications.	

3 SEM	**SUB CODE: 18 ECL38**	**SUB NAME: Digital System Design Laboratory**
CO1	Demonstrate the truthtable of various expressions and combinational circuits using logic gates.	
CO2	Design various combinational circuits such as adders,subtractors,comparators,multiplexers and demultiplexers	
CO3	Construct flipflops,counters and shift registers.	
CO4	Realize Boolean expressions using decoders	
CO5	Simulate serial adders and multipliers	
CO6		

4 Semester

4SEM	**SUB CODE: 18MAT41**	**SUB NAME:Engg. Mathematics - IV**
CO1		
CO2		
CO3		
CO4		
CO5		
CO6		

4 SEM	**SUB CODE: 18EC42**	**SUB NAME: Analog Circuits**
CO1	Explain the characteristics and operation of BJTs and FETs	

CO2	Design and analyse different types of BJT and FET amplifier circuits
CO3	Apply and distinguish the concept of feedback in amplifiers and oscillators
CO4	Illustrate the functioning of linear ICs in their basic configurations
CO5	Design of linear ICs and 555 timer based circuits
CO6	

4 SEM **SUB CODE: 18EC43** **SUB NAME: Control Systems**

CO1	To study fundamentals of control system and to define transfer function for mathematical modelling of systems.
CO2	Describe system performance using time response and its specifications.
CO3	To apply knowledge of transfer function to establish stability and its consequence for a system..
CO4	To interpret system stability in frequency domain.
CO5	To study and understand modern control theory.
CO6	

4 SEM **SUB CODE: 18EC44** **SUB NAME: Engineering Statistics & Linear Algebra**

CO1	Characterize probability models & distribution functions based on single and multiple random variables.
CO2	Apply and evaluate moments, characteristic functions and statistical averages.
CO3	Understand the concept of random processes and determine covariance & spectral densities of stationary random processes
CO4	Understand & apply the concept of vector spaces, linear independence and orthogonality
CO5	Apply matrix operations to evaluate eigen values, eigen vectors, diagonalization & SVD
CO6	

4 SEM **SUB CODE: 18EC45** **SUB NAME: Signals & Systems**

CO1	Define, describe and classify signals and systems.
CO2	Determine the response of LTI systems using convolution operations
CO3	Determine the response of LTI systems using convolution operations
CO4	Analyze discrete time signals and systems using DTFT and Z – transforms.
CO5	Apply the properties of Fourier series , Fourier Transforms and Z- transforms

4 SEM **SUB CODE: 18EC46** **SUB NAME: Microcontroller**

CO1	Explain the internal structure of microcontroller
CO2	Illustrate the operations of internal peripherals
CO3	Write an assembly level programs using instruction set
CO4	Develop assembly and C language program for on-chip peripherals
CO5	Demonstrate the interfacing of external peripherals to microcontroller

4 SEM **SUB CODE: 18ECL47** **SUB NAME: Microcontroller Laboratory**

CO1	Program 8051 for solving arithmetic and logical operations using assembly language.

CO2	Program 8051 for generation of delays using timers..
CO3	Implementing serial data communication using C language
CO4	Interface different input output devices to 8051 and control them using assembly language programs.
CO5	Program 8051 to Generate different waveforms.

4 SEM	SUB CODE: 18ECL48	SUB NAME: Analog Circuits Laboratory
CO1	Design, test and evaluate BJT/FET amplifiers in CE/CS configuration.	
CO2	Design and Test various types of oscillators.	
CO3	Design and test the applications of OpAmps such as adders, differentiator, integrator, precision rectifier etc.	
CO4	Design and test the frequency response of active filters.	
CO5	Analyze and Test the operation of DAC for a given step size using OpAmp.	
CO6	Design and test 555 timer based multivibrator circuits.	

CO1
CO2
CO3
CO4
CO5

5 Semester

5 SEM	SUB CODE:1 8ES51	SUB NAME: TIM&E
CO1	Explain the fundamental concepts of Management and Enterpreneurship	
CO2	Describe the functions of processes of a management to achieve goals set for an organisation	
CO3	Understand the significant contributions of Family Business	
CO4	Discuss the basic structure of a business model and feasibility	
CO5	Awareness about various sources of funding and institutions funding businesses	

5 SEM	SUB CODE: 18EC52	SUB NAME: DSP
CO1	Perform frequency domain sampling and reconstruction of discrete time signals, computation of DFT / IDFT of any given sequence.	
CO2	Recall the properties of DFT and use the DFT in Linear filtering.	
CO3	Compute DFT efficiently using FFT algorithms.	
CO4	Design & Implement FIR & IIR Filters.	
CO5	Understand the architecture and working of DSP processor.	

5 SEM	SUB CODE: 18EC53	SUB NAME: Pricnciples of Communication system
CO1	Represent analog signals in time domain as random processes and in frequency domain using Fourier transforms.	
CO2	Discuss the performance of analog and pulse modulation schemes in time and frequency domains.	
CO3	Examine various techniques for the generation and detection of amplitude, angle and pulse modulated signals and apply them in design of simple communication systems.	
CO4	Analyze the influence of channel on analog modulated signals and compare the performance of various analog modulation schemes	
CO5	Translate an analog signal to digital signal using various pulse modulation techniques.	

5 SEM	SUB CODE: 18EC54	SUB NAME: ITC
CO1	Explain and apply the concepts of Entropy, Rate of Information and Order of a source with respect to Dependent & Independent Source.	
CO2	Represent the information using Shannon ,Shannon Fano, Huffman, Arithmetic, LZ, Encoding Algorithms and construct tables for the output of a source.	
CO3	Model the continuous and discrete communication channels using input, output and joint probabilities	
CO4	Compute a codeword using Linear Block , cyclic & convolutional coding techniques for error detection and correction	
CO5	Design the encoding and decoding circuits for Linear Block codes, cyclic codes, convolutional codes,	

5 SEM	SUB CODE: 18EC55	SUB NAME:Electromagnetic Waves
CO1	Acquire the knowledge of basic concepts of electric and magnetic fields	
CO2	Interpret the laws and theorems of electric and magnetic fields	
CO3	Apply knowledge of fields on various electric and electronic systems	
CO4	Understand the concept of wave propagation with the aid of Maxwell's equation	
CO5		

5 SEM	SUB CODE: 18EC56	SUB NAME: Verilog HDL
CO1	Acquiring knowledge on digital design and different modeling concepts of Verilog HDL	
CO2	Analyzing structure of a verilog program and usage of tasks and directives	
CO3	Designing digital circuits using gate level and data flow modeling with suitable test bench	
CO4	Designing digital circuits using behavioral style of programming with suitable test bench	
CO5	Programming using functions and tasks	

5 SEM	SUB CODE: 18ECL57	SUB NAME: DSP Lab
CO1	Understand the concepts of analog to digital conversion of signals and perform sampling process.	
CO2	Realize various signal processing operations using MATLAB tool.	
CO3	Realize the digital filters using the simulation tool & analyze the response of the filter for an audio signal.	

CO4	Implement signal processing operations & generate sine wave & standard test signals using the DSP processor.

5 SEM **SUB CODE: 18ECL58** **SUB NAME: HDL Lab**

CO1 Design, simulate and synthesize combinational circuits. Verify the code using test bench and FPGA.
CO2 Design, simulate and synthesize sequential circuits. Verify the code using test bench and FPGA
CO3 Design and synthesize the DAC, Elevator and Clock division circuit using HDL. Verify the code using FPGA
CO4 Design and synthesize HDL program to interface DC and stepper motor circuits.
CO5
CO6

5 SEM **SUB CODE: 18CIV59** **SUB NAME: Environmental Studies**

CO1
CO2
CO3
CO4
CO5
CO6

6 Semester

6 SEM **SUB CODE: 18EC61** **SUB NAME: Digital Communication**

CO1	Analyze baseband and bandpass signals in time and frequency domain.
CO2	Apply the knowledge of statistical theory of communication and explain the conventional digital communication system.
CO3	Analyze the channel characteristics in noisy environment.
CO4	Evaluate and analyze the performance of receiver in digital communication system.
CO5	Describe the digital communication system with spread spectrum modulation techniques.

6 SEM **SUB CODE: 18EC62** **SUB NAME: ES**

CO1 Describe the architectural features and instructions of 32 bit microcontroller ARM Cortex M3.
CO2 Apply the knowledge gained for Programming ARM Cortex M3 for different applications
CO3 Analyze the channel characteristics in noisy environment.
CO4 Evaluate and analyze the performance of receiver in digital communication system.
CO5 Describe the digital communication system with spread spectrum modulation techniques.

6 SEM **SUB CODE: 18EC63** **SUB NAME: Microwave and Antennas**

CO1	Explain the use and advantages of microwave transmission.
CO2	Identify the various microwave devices and types of striplines

CO3	Analyse various microwave parameters related to microwave transmission lines and waveguides
CO4	To define and interpret the various antenna parameters.
CO5	Classify the various types of antenna and analyse its radiation pattern.
CO6	

6 SEM	SUB CODE: 18EC643	SUB NAME:Data structures using C++
CO1	Relate to Dynamic memory allocation, various types of data structures, operations and algorithms and Sparse matrices and Harshing.	
CO2	Apply Object oriented approach to solve problems	
CO3	Understand non-Linear data structures trees and their applications	
CO4	Design appropriate data structures for solving computing problems	
CO5	Analyse the operations of Linear Data Structures: Stack, Queue and Linked List and their application	

6 SEM	SUB CODE: 18EC646	SUB NAME: Python Application Programming
CO1	Examine Python syntax and semantics and be fluent in the use of Python	
CO2	Examine Python syntax and semantics and be fluent in the use of Python flow control and functions	
CO3	Demonstrate proficiency in handling Strings and File Systems.	
CO4	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.	
CO5	Interpret the concepts of Object-Oriented Programming as used in Python. Implement exemplary applications related to Network Programming, Web Services and Databases in Python.	
CO6		

6 SEM	SUB CODE: 18EC655	SUB NAME: Java
CO1		
CO2		
CO3		
CO4		
CO5		

6 SEM	SUB CODE: 18ECL66	SUB NAME: Embedded system Lab
CO1	Develop assembly language programs using ARM controller with Keil Micro Vision 4.0.	
CO2	Interface DAC and Motors with ARM Cortex M3.	
CO3	Interfacing I/O Devices with ARM Cortex M3.	
CO4	Analyzing the communication protocols interfaced to ARM Cortex M3.	
CO5		

6 SEM	SUB CODE: 18ECL67	SUB NAME: Commmunication Lab
CO1	Determine the characteristics and response of microwave waveguide.	
CO2	Determine the characteristics of microstrip antennas and devices and compute the parameters associatedwith it	
CO3	Design and test the digital and analog modulation circuits and display the waveforms.	
CO4	Simulate the digital modulation systems and compare the error performance of basic digital modulation schemes.	
CO5		

6 SEM	SUB CODE: 18ECMP68	SUB NAME: Miniproject
CO1	Able to identify and formulate a problem statement through literature survey and understand the importance of team work & time management.	
CO2	Devise engineering solutions for proposed project using a systematic approach.	
CO3	Apply engineering knowledge to design and develop the project.	
CO4	Exibit written and oral communication interpersonal skills.	
CO5	Demonstrate, present and defend the project work to a panel of experts.	

7 Semester

7 SEM	SUB CODE: 18EC71	SUB NAME:Computer Networks
CO1	Describe the layering architecture of computer networks and distinguish between the OSI model and TCP/IP protocol suite.	
CO2	Discuss and analyze the protocols and services of Data link layer.Discuss the basic network configurations and standards of wired and wireless LANs.	
CO3	Configuring IPv4 addresses for networks and determine the routing of packets using different routing algorithms.	
CO4	Analyse the protocols and functions associated with the transport layer services.	
CO5	Describe the protocols and functions associated with the application layer services.	
CO6		

7 SEM	SUB CODE: 18EC72	SUB NAME: VLSI Design
CO1	Demonstrate understanding of MOS transistor theory, CMOS fabrication flow and technology scaling.	
CO2	Draw the basic gates using the stick and layout diagrams with the knowledge of physical design aspects.	
CO3	Demonstrate ability to design combinational, sequential and dynamic logic circuits as per the requirements.	
CO4	Interpret memory elements along with timing considerations.	
CO5	Interpret testing and testability issues in VLSI design.	
CO6		

7 SEM	SUB CODE: 18EC731	SUB NAME: Real Time Systems
CO1	Discuss the historical background of Real-time systems and its classifications.	
CO2	Describe the concepts of computer control and hardware components for Real-Time Application.	
CO3	Discuss the languages to develop software for Real-Time Applications	
CO4	Explain the concepts of operating system and RTS development methodologies	
CO5		
CO6		

7 SEM	SUB CODE: 18EC732	SUB NAME: Satelite Communication
CO1	Define the basic principles of satellite orbits and trajectories.	
CO2	Discuss the electronic systems associated with a satellite and the earth station	
CO3	Describe the various technologies associated with the satellite communication	
CO4	Explain the communication satellite and the national satellite system and other domain services	

CO5	Describe the role of earth stations and ground systems for satellite applications
CO6	

7 SEM	SUB CODE: 18EC733	SUB NAME: Digital Image Processing
CO1	Explain fundamental concepts of digital image processing systems.	
CO2	Identify various techniques for improving image quality in spatial domain	
CO3	Determine and analyze frequency domain representation of images for quality improvement.	
CO4	Examine various techniques for image restoration	
CO5	Analyze various color Image Processing techniques and Morphological operators.	
CO6		

7 SEM	SUB CODE: 18EC744	SUB NAME: Cryptography
CO1	Illustrate the concepts of number theory and fields and apply them for various cryptographic algorithms	
CO2	Encrypt and decrypt the data using Symmetric and Asymmetric classical cryptographic algorithms.	
CO3	Examine the use of Symmetric and Asymmetric modern block cryptographic algorithms to encrypt and decrypt the data	
CO4	Generate pseudorandom number generators and stream ciphers required for cryptographic applications	
CO5		
CO6		

7 SEM	SUB CODE: 18EC745	SUB NAME: ML with Python
CO1	Understand what is Machine learning and its use in the design of intelligent machines.	
CO2	Appreciate the underlying mathematical relationships within and across Machine Learning algorithms.	
CO3	Explain paradigms of supervised and un-supervised learning.	
CO4	Have a good understanding of the problems that arise when dealing with very small and very big datasets, and how to solve them.	
CO5	Recognize a real world problem and apply the learned techniques of Machine Learning to solve the problem.	

7 SEM	SUB CODE: 18EI752	SUB NAME: OE robotics
CO1	Identify basic components of robot system and its functionality	
CO2	Identify DH representation of robot and homogenous transformation for various arm configurations.	
CO3	Analyze the functions of sensors in the robot.	
CO4	Solve forward and inverse kinematic problems.	
CO5	Evaluate and compare the use Robots in different applications.	
CO6	Recognize material-handling applications, processing operations, assembly and inspection operations to increase product quality and uniformity in minimize	

7 SEM	SUB CODE: 18CS753	SUB NAME: Introduction to AI
CO1		
CO2		
CO3		
CO4		

CO5	
CO6	

7 SEM	**SUB CODE: 18EE752**	**SUB NAME: Electric Vehicles**
CO1		
CO2		
CO3		
CO4		
CO5		
CO6		
CO6		

7 SEM	**SUB CODE: 18EC76**	**SUB NAME:Computer Networks Lab**
CO1	Utilize the network simulators like NS3 and NCTUns for building different network topologies	
CO2	Configure network elements like nodes, switches, bridges ,routers to build different types of networks.	
CO3	Simulate networks with different configurations and measure the performance parameters.	
CO4	Realize the operations of datalink layer protocols and algorithms using C programming.	
CO5	Implement the routing and transport layer protocols using C programming.	
CO6		

7 SEM	**SUB CODE: 18EC77**	**SUB NAME:VLSI Lab**
CO1	Write test bench to simulate various combinational and sequential digital circuits.	
CO2	Understand the flow of the ASIC design flow and understand the process of synthesis, synthesis constraints and evaluating the synthesis report to obtain optimum gate lev	
CO3	Simulate basic CMOS circuits like inverter and NAND gate and post layout simulation.	
CO4	Simulate Common source amplifier and interpret transient, DC and AC analysis.	
CO5	Simulate Operational amplifier and interpret transient, DC and AC analysis.	
CO6		

7 SEM	**SUB CODE: 18CP78**	**BSU/ARK/SVU**	**SUB NAME: Project Work**
CO1	Able to identify and formulate a problem statement through literature survey and understand the importance of team work & time management.		
CO2	Devise engineering solutions for proposed project using a systematic approach.		
CO3	Apply engineering knowledge to design and develop the project.		
CO4	Exibit written and oral communication interpersonal skills.		
CO5	Demonstrate, present and defend the project work to a panel of experts.		
CO6			

8 Semester

8 SEM	**SUB CODE: 18EC81**	**SUB NAME: Wireless and Cellular communication**
CO1	Explain concepts of propagation mechanisms like Reflection, Diffraction, Scattering in wireless channel	
CO2	Develop a scheme for idle mode, call set up, call progress handling and call tear down in a GSM cellular network.	

CO3	Develop a scheme for idle mode, call set up, call progress handling and call tear down in a CDMA cellular network.
CO4	Understand the Basic operations of Air interface in a LTE 4G system
CO5	

8 SEM	**SUB CODE:18EC821**	**SUB NAME: Network security**
CO1	Explain network security services and mechanisms and explain security concep	
CO2	Explain network security protocols in the Transport and Network layer	
CO3	Analyze the security issues and counter measures due to malicious software	
CO4	Develop an understanding on attaining secure network using firewalls, Firewall Characteristics, Biasing and Configuration	
CO5		
CO6		

8 SEM	**SUB CODE: 18EC24**	**SUB NAME: Optical communication network**
CO1	Elaborate on the principle of operation, structure, modes and parameters of optical fiber	
CO2	Estimate attenuation and distortion in optic fiber caused by various phenomena during signal propagation.	
CO3	Distinguish between optical sources & detectors and Illustrate different stages of optical receiver.	
CO4	Discuss the construction and working principle of various optical devices needed like connectors, multiplexers and amplifiers in Fiber optics.	
CO5	Define networking aspects of optical fiber and describe various networking standards associated with it.	
CO6		

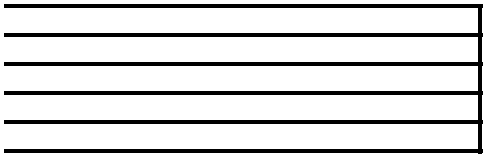
8 SEM	**SUB CODE: 18ECP83**	**SUB NAME: Project Phase 2**
CO1	Able to identify and formulate a problem statement through literature survey and understand the importance of team work & time management.	
CO2	Devise engineering solutions for proposed project using a systematic approach.	
CO3	Apply engineering knowledge to design and develop the project.	
CO4	Exibit written and oral communication interpersonal skills.	
CO5	Demonstrate, present and defend the project work to a panel of experts.	
CO6		

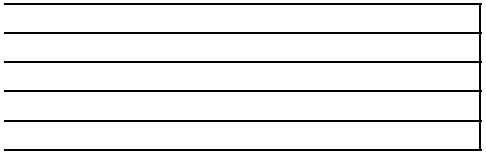
8 SEM	**SUB CODE: 18ECS84**	**SUB NAME: Technical Seminar**
CO1	Competence in relevant definition and explanation of the topic under discussion(Presentation Skills)	
CO2	Identification of proper and relevant Technical content(Quality of Technical Content)	
CO3	In depth understanding of contents of the topic in discussion and critical thinking (question &Answer)	
CO4	The skill of gaining information and insights into various topics of interest(referring extra papers related to seminar Topic)	
CO5	The sense of Punctuality and responsibility of time. (On time presentation+ATTENDANCE)	
CO6	The development of written and documentation skills (Report)	

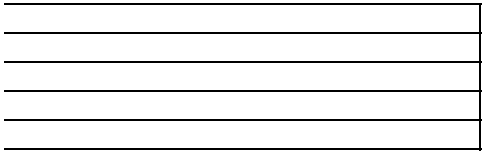
8 SEM	**SUB CODE: 18ECI85**	**SMN**	**SUB NAME: Internship**
CO1	Integrate theory and practice.		
CO2	Develop communication,interpersonal,and other critical skills.		
CO3	Practice the qualities of professional writing skillsand to understand how to apply technical information and knowledge in practical documents.		

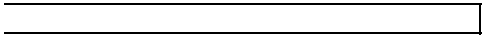
CO4	Able to practice acquired knowledge within the chosen area of technology for project development.
CO5	Assess interests and abilities in their field of study.

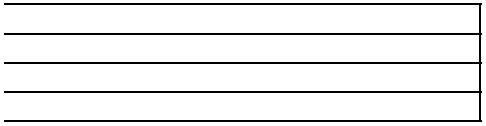
el netlist.

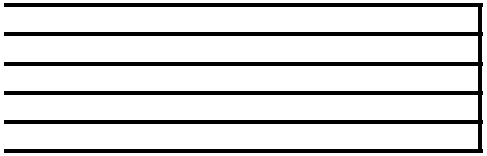






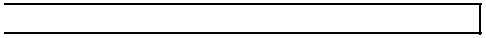


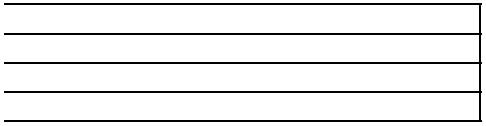




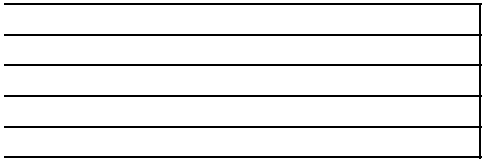


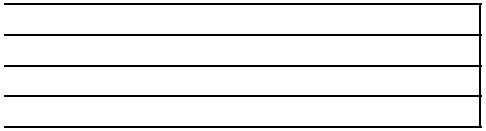




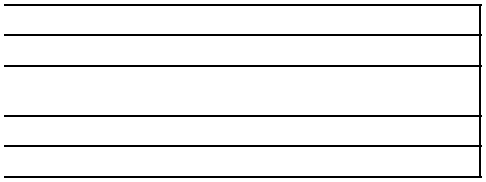


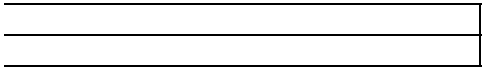


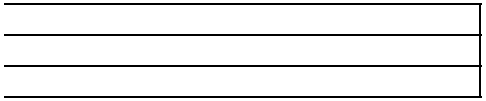


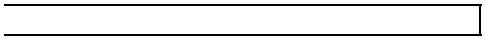


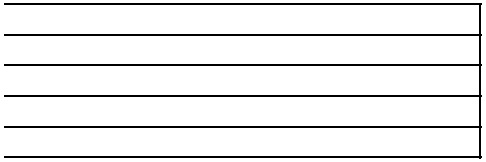




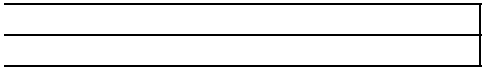












SUB CODE: 18ELN15 / 25 SUB NAME: BASIC ELECTRONICS

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1												1	
CO2		1												1	
CO3		1												1	
CO4		1												1	
CO5		1	1											1	
Final_CO_one_row		1	1	#DIV/0!	#DIV/0!									1	#DIV/0!

3 Semester

3SEM SUB CODE: 18MAT31 SUB NAME:Engg. Mathematics - III

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Final_CO_one_row		#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	####	#DIV/0!	#DIV/0!

3SEM SUB CODE: 18EC32 SRK SUB NAME: Network Theory

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		3	3	2	2										
CO2		3	3	2	2										
CO3		3	3	2	2										
CO4		3	3	2	2										
CO5		3	3	2	2										
CO6		3	3	2	2										
Final_CO_one_row		3	3	2	2	0	0	0	0	0	0	0	0	0	#DIV/0!

3SEM SUB CODE: 18EC33 SUB NAME: Electronic Devices

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		3	1	1									2	2	
CO2		3	2	1									2	2	
CO3		3	1	2									2	2	1
CO4		2	3		3								2	2	
CO5		2	3		3								2	2	
CO6															
Final_CO_one_row	2.6	2	1.3	3	0	0	0	0	0	0	0	0	2	2	1

3SEM SUB CODE: 18EC34 SUB NAME: Digital System Design

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1											1	2	
CO2			2	1	1								1	2	
CO3		2											1	2	
CO4			2	1	1								1	2	
CO5			2	2	2								1	2	
Final_CO_one_row		1.5	2	1.333333	1.333333	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	1	2	#DIV/0!

3SEM SUB CODE: 18EC35 SUB NAME: Computer Organization & Architecture

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		3											2	3	
CO2		3	2										2	2	
CO3		3											2	2	
CO4		3	2	3	1								1	3	1

CO5		3	3	3	2	1							1	3	2
Final_CO_one_x		3	2.333333	3	1.5	1	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	1.6	**2.6**	**1.5**

3SEM SUB CODE: 18EC36 SUB NAME: Power Electronics & Instrumentation

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		**1**	**1**	**1**									**1**	**2**	
CO2		**1**	**2**	**1**									**1**	**2**	
CO3			**2**	**2**										**2**	
CO4		**1**	**2**	**1**										**2**	
CO5			**1**	**2**										**2**	
CO6														**2**	
Final_CO_one_x		**1**	**1.6**	**1.4**									**1**	**2**	

3 SEM SUB CODE: 18ECL37 AV SUB NAME: Electronic Devices &

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	2	3	2								2	3	
CO2		2	2	3	2								2	3	
CO3		2		2	2								1	3	
CO4		2	2	1									1	3	
CO5		2	2	2	2	3							1	3	3
CO6															
Final_CO_one_x		2	2	2.2	2	3	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	1.4	**3**	**3**

3 SEM SUB CODE: 18 ECL38 GY SUB NAME: Digital System Design Laborat

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2		1						1			2	2	
CO2		2		2						1			2	2	
CO3		2		1						1			1	2	
CO4		2		1						1			1	2	
CO5		2		1						1			1	2	1
CO6															
Final_CO_one_x		2	#DIV/0!	1.2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	#DIV/0!	#DIV/0!	1.4	**2**	**1**

4 Semester

4SEM SUB CODE: 18MAT41 SUB NAME:Engg. Mathematics - IV

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Final_CO_one_x		#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	####	**#DIV/0!**	**#DIV/0!**

4 SEM SUB CODE: 18EC42 SUB NAME: Analog Circuits

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	1	1									1		
CO2		3	3	3	2	2			1		1	2	1	2	2
CO3		3	3	3	2	2			1		1	2	1	2	2
CO4		2	1	1									1		
CO5		3	3	3	2	2			1		1	2	1	2	2
CO6															
Final_CO_one_x		**2.6**	**2.2**	**2.2**	**2**	**2**	**#DIV/0!**	**#DIV/0!**	**1**	**#####**	**1**	**2**	**1**	**2**	**#REF!**

4 SEM SUB CODE: 18EC43 SUB NAME: Control Systems

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1												1	
CO2		2	2											1	

CO3		1	2		1								1		
CO4		1	2		1								1		
CO5		1			1								1		
CO6															
Final_CO_one_row		1.2	2	#DIV/0!	1	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	####	**1**	**#DIV/0!**

4 SEM SUB CODE: 18EC44 SMB SUB NAME: Engineering Statistics

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	2	1										2	
CO2		2	2	1										2	
CO3		2	2	2									1	2	
CO4		2	3	2									1	2	
CO5		2	3	2									2	2	
CO6															
Final_CO_one_row		2	2.4	1.6	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	1.33	**2**	**#DIV/0!**

4 SEM SUB CODE: 18EC45 SUB NAME: Signals & Systems

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		3	1											1	
CO2		2	2	1										1	
CO3		1	2	1										2	
CO4		1	2	2										2	
CO5		1	2	2										2	
Final_CO_one_row		**1.6**	**1.8**	**1.5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1.6**	**0**

4 SEM SUB CODE: 18EC46 SUB NAME: Microcontroller

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2													
CO2		2				1									
CO3		1				1									
CO4				3										1	
CO5				3										1	
Final_CO_one_row		1.667	#DIV/0!	3	#DIV/0!	1	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	####	**1**	**#DIV/0!**

4 SEM SUB CODE: 18ECL47 SUB NAME: Microcontroller Laboratory

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1													1
CO2		1													1
CO3		1													1
CO4		1				3									2
Final_CO_one_row		**1**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**3**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	#####	**#DIV/0!**	**#DIV/0!**	####	**#DIV/0!**	**1.25**

4 SEM SUB CODE: 18ECL48 SUB NAME: Analog Circuits Laboratory

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	2	3	2								1	3	
CO2		2	2	3	2	3							1	3	1
CO3		2	2	3	2	3							1	3	1
CO4		2	2	3	2	3							1	3	1
CO5		2	2		2								1	3	
CO6		2	2	3	2	3							1	3	1
Final_CO_one_row		2	2	3	2	3							1	**3**	**1**

5 SEM SUB CODE:1 8ES51 SUB NAME: TIM &E

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2

CO1						1	1	2	2	1	1			2	
CO2						1	1	2	2	2	1			1	
CO3						1	1	2	2	1	1			1	
CO4						1	1		1	1				3	
CO5						1					2				
CO6															
Final_CO_one_row		#####	#DIV/0!	#DIV/0!	#DIV/0!	1	1		1.75	1.25	1.25	#DIV/0!	####	**1.75**	**#DIV/0!**

5 SEM SUB CODE: 18EC52 SUB NAME: DSP

		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1		3	2		1									2	
CO2		2	1											1	
CO3		2	2	1										1	
CO4		2	2	2	1									3	
CO5				1		1									1
Final_CO_one_row		2.25	1.75	1.333333	1	1								**1.75**	**1**

5 SEM SUB CODE: 18EC53 SUB NAME: Pricnciples of Communication syst

		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1		2	1					-	--	-	-	-	1	2	
CO2		2	1										1	2	
CO3		2	2	1									1	3	
CO4		2	2										1	2	
CO5		2	1	1									1	3	
CO6															
Final_CO_one_row		2	1.4	1	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	1	**2.4**	**#DIV/0!**

5 SEM SUB CODE: 18EC54 SUB NAME: ITC

		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1		3	3											1	
CO2		3	3	2	1									2	
CO3		3	3	2	1									2	
CO4		3	2	2										2	
CO5		2	2	2	2									2	
CO6															
Final_CO_one_row		2.8	2.6	2	1.333333	#DIV/0!	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	####	**1.8**	**#DIV/0!**

5 SEM SUB CODE: 18EC55 SUB NAME:Electromagnetic Waves

		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1		3	2	3									1	1	
CO2		3	2	3									1	2	
CO3		3	2	1									1	2	
CO4		3	1										1	1	
CO5															
CO6															
Final_CO_one_row		3	1.75	2.333333	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	1	**1.5**	**#DIV/0!**

5 SEM SUB CODE: 18EC56 SUB NAME: Verilog HDL

		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**

CO1		1											1	2	
CO2		1				2							1		2
CO3		1	1			2							1	2	2
CO4		1	1			2							1	2	2
CO5		1											1	1	
CO6															
Final_CO_one_row		1	1	#DIV/0!	#DIV/0!	2	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	1	**1.75**	**2**

5 SEM SUB CODE: 18ECL57 **SUB NAME: DSP Lab**

		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1		1				1									1
CO2		1				1								1	1
CO3		1				2								1	1
CO4		1				2							1		1
Final_CO_one_row		1				1.5							1	**1**	**1**

5 SEM SUB CODE: 18ECL58 **SUB NAME: HDL Lab**

		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1		2				2								1	2
CO2		2	1			2								1	2
CO3		2	1			2								1	2
CO4		2	1		1	2							1	1	2
CO5		1	1	1	2	1								2	2
CO6															
Final_CO_one_row		1.8	1	1	1.5	1.8							1	**1.2**	**2**

5 SEM SUB CODE: 18CIV59 **SUB NAME: Environmental Studies**

		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Final_CO_one_row		#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	####	**#DIV/0!**	**#DIV/0!**

6 SEM SUB CODE: 18EC61 **SUB NAME: Digital Communication**

		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1		2	1											1	
CO2		3	1											1	
CO3		2												1	
CO4		2	2	1	1									1	
CO5		1	1											1	
CO6															
Final_CO_one_row		2	1.25	1	1	#DIV/0!	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	####	**#REF!**	**#DIV/0!**

6 SEM SUB CODE: 18EC62 **SUB NAME: ES**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	2	3	3	1					1		1	3	2
CO2		3	3	3	3	1					1		1	3	2
CO3		3	3	3	3	1					1		1	3	2
CO4		2	2	2	2	1					1		1	3	2
CO5		1	1	1	1	1					1		1	3	2
CO6															
Final_CO_one_row		2.2	2.2	2.4	2.4	1	#DIV/0!		#DIV/0!	#####	1	#DIV/0!	1	3	2

6 SEM SUB CODE: 18EC63 **SUB NAME: Microwave and Antennas**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1												1	
CO2			1												
CO3		1	2											1	1
CO4		2												1	
CO5			2											1	2
CO6															
Final_CO_one_row		1.333	1.666667	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	####	1	1.5

6 SEM SUB CODE: 18EC643 **SUB NAME:Data structures using C++**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1	1	1		1							1	1	1
CO2		1	2	1		1							1	1	1
CO3		1	1	1		1							1	1	1
CO4		1	2	2	1	1							1	1	1
CO5		1	2	1	1	1							1	1	1
CO6															
Final_CO_one_row		1	1.6	1.2	1	1	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	1	1	1

6 SEM SUB CODE: 18EC646 **SUB NAME: Python Application Programı**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	1	1	2	1							1	1	1
CO2		1	2	2	2	1							1	1	1
CO3		1	1	1	1	1							1	1	1
CO4		1	2	1	2	1							1	1	2
CO5		1	1	1	2	1							1	1	2
CO6															
Final_CO_one_row		1.2	1.4	1.2	1.8	1	0	0	0	0	0	0	1	1	1.4

6 SEM SUB CODE: 18EC653 **SUB NAME: Java**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Final_CO_one_row		#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	####	#DIV/0!	#DIV/0!

6 SEM SUB CODE: 18ECL66 **SUB NAME: Embedded system Lab**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1	1			1							1	2	
CO2		1	2	1		1				1			1	2	1
CO3		1	2	1		1				1			1	2	1
CO4		1	2	1		1				1			1	2	1
CO5															
CO6															
Final_CO_one_row		1	1.75	1	0	1	0		0	1	0	0	1	2	1

6 SEM SUB CODE: 18ECL67 **SUB NAME: Commmunication Lab**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2												2	
CO2		2												2	
CO3		2		2		2								2	
CO4		2		1	1	2									
CO5															
CO6															
Final_CO_one_row		2	#DIV/0!	1.5	1	2	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	####	2	#DIV/0!

6 SEM SUB CODE: 18ECMP68 **SUB NAME: Miniproject**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	3				2		2	3	2		2		
CO2		2								2	3		2		
CO3			3	2	2	2				3	3	2	2	2	2
CO4									2	2	3		2		
CO5			2	2						3	3	3	2		
CO6		2	2.7	2	2	2	2	0	2	2.6	2.8	2.5	2	2	
Final_CO_one_row		2	2.675	2	2	2	2		2	2.6	2.8	2.5	2	2	2

7 SEM SUB CODE: 18EC71 **SUB NAME:Computer Networks**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1	1										1	1	
CO2		2	3										1	1	
CO3		2	1										1	1	
CO4		2	2	2									1	2	
CO5		2	2	2									1	2	
CO6															
Final_CO_one_row		1.8	1.8	2	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	1	1.4	#DIV/0!

7 SEM SUB CODE: 18EC72 **SUB NAME: VLSI Design**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		3	3											1	
CO2		3	3	2	1									3	
CO3		3	3	2	1									3	
CO4		3	2	2										2	
CO5		2	2	2	2									3	
CO6															
Final_CO_one_row		2.8	2.6	2	1.333333	#DIV/0!	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	####	2.4	#DIV/0!

7 SEM SUB CODE: 18EC731 **SUB NAME: Real Time Systems**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		3	2											2	
CO2		2	2											1	
CO3		2	2	3										2	
CO4		2	2	3										1	
CO5															
CO6															
Final_CO_one_row		2.25	2	3	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	####	**1.5**	**#DIV/0!**

7 SEM SUB CODE: 18EC732 **SUB NAME: Satelite Communication**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	2	1	1									1	
CO2		2	2	1										1	
CO3		2	2	1										1	
CO4			1	1										1	
CO5				1										1	
CO6															
Final_CO_one_row		2	1.75	1	1	#DIV/0!	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	####	**1**	**#DIV/0!**

7 SEM SUB CODE: 18EC733 **SUB NAME: Digital Image Processing**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	2	2	1									3	
CO2		2	2	2	2	1								3	2
CO3		2	2	1	2									3	
CO4		2	2	2	1									3	2
CO5		1	1	2	1									3	
CO6															
Final_CO_one_row		1.8	1.8	1.8	1.4	1	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	####	3	2

7 SEM SUB CODE: 18EC744 **SUB NAME: Cryptography**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		3	3	1									1	2	
CO2		3	1										1	2	
CO3		3	3	2			1							3	
CO4		2	2											2	1
CO5															
CO6															
Final_CO_one_row		2.75	2.25	1.5	#DIV/0!	#DIV/0!	1		#DIV/0!	#####	#DIV/0!	#DIV/0!	1	**2.25**	**1**

7 SEM SUB CODE: 18EC745 **SUB NAME: ML with Python**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1			2												
CO2		3	3	2		2									
CO3		3	3	3	3	2								2	
CO4		3	3	3	3	3	1							3	
CO5		3	3	3	3	3	3							3	
CO6															

Final_CO_one_row		3	2.8	2.75	3	2.5	2							**2.67**	

7 SEM SUB CODE: 18EI752 **SUB NAME: Robotics**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	1	2						1			2	1	1
CO2		2	1	2						1			2	1	1
CO3		2	2	3						1			2	1	1
CO4		2	2	0						0			0	1	1
CO5		2	2	3						1			2	1	1
CO6		2	2	3						1			2	1	1
Final_CO_one_row		2	1.666667	2.166667	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	0.833	#DIV/0!	#DIV/0!	1.67	**1**	**1**

7 SEM SUB CODE: 18CS753 **SUB NAME: Introduction to AI**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Final_CO_one_row		#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	####	**#DIV/0!**	**#DIV/0!**

7 SEM SUB CODE: 18EE752 **SUB NAME: Electric Vehicles**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Final_CO_one_row		#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	####	**#DIV/0!**	**#DIV/0!**

7 SEM SUB CODE: 18EC76 **SUB NAME:Computer Networks Lab**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	1			3					1		1		2
CO2		2	1			2					1		1		2
CO3		2	2			2					1		1	1	2
CO4		1	1			1					1		1		2
CO5		1	2			2					1		1	1	2
CO6															
Final_CO_one_row		1.6	1.4	#DIV/0!	#DIV/0!	2	#DIV/0!		#DIV/0!	#####	1	#DIV/0!	1	**1**	**2**

7 SEM SUB CODE: 18EC77 **SUB NAME:VLSI Lab**

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1	1	2		2								2	
CO2		2	1	2		2								2	
CO3			1	2		2								2	

CO4		1	1	2		2								2	
CO5		2	2	2		2								2	
CO6															
Final_CO_one_row		1.5	1.2	2	#DIV/0!	2	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	####	**2**	**#DIV/0!**

7 SEM SUB CODE: 18CP78 BSU/ARK/SVU SUB NAME: Project Work

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	3				2		2	3	2		2		
CO2		2								2	3		2		
CO3			3	2	2	2				3	3	2	2	3	3
CO4									2	2	3		2		
CO5			2	2						3	3	3	2		
CO6		**2**	**2.7**	**2**	**2**	**2**	**2**	**0**	**2**	**2.6**	**2.8**	**2.5**	2	3	
Final_CO_one_row		**2**	**2.7**	**2**	**2**	**2**	**2**	**0**	**2**	**2.6**	**2.8**	**2.5**	**2**	**3**	**3**

8 SEM SUB CODE: 18EC81 SUB NAME: Wireless and Cellular communica

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Final_CO_one_row		#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	####	**#DIV/0!**	**#DIV/0!**

8 SEM SUB CODE:18EC821 SUB NAME: Network security

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		1	1	1										1	
CO2		1	1	1									1	1	
CO3				2	1									2	
CO4				2	1									2	
CO5															
CO6															
Final_CO_one_row		1	1	1.5	1	#DIV/0!	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	1	**1.5**	**#DIV/0!**

8 SEM SUB CODE: 18EC24 SUB NAME: Optical communication netwo

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		3	3	1	1		1	1						3	1
CO2		3	3	2	1		1	1						3	1
CO3		3	2	2	1		1	1						3	1
CO4		2	3	2	1		1	1						3	1
CO5		3	3	1	2		1	1						3	1
CO6															
Final_CO_one_row		2.8	2.8	1.6	1.2	#DIV/0!	1		#DIV/0!	#####	#DIV/0!	#DIV/0!	####	**3**	**1**

8 SEM SUB CODE: 18ECP83 SUB NAME: Project Phase 2

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2	3				2		2	3	2		2		
CO2		2								2	3		2		

CO3			3	2	2	2				3	3	2	2	3	3
CO4									2	2	3		2		
CO5			2	2						3	3	3	2		
CO6		**2**	**2.7**	**2**	**2**	**2**	**2**	**0**	**2**	**2.6**	**2.8**	**2.5**	2	3	
Final_CO_one_row		**2**	**2.7**	**2**	**2**	**2**	**2**	**0**	**2**	**2.6**	**2.8**	**2.5**	**2**	**3**	**3**

8 SEM SUB CODE: 18ECS84 **SUB NAME: Technical Seminar**

		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Final_CO_one_row		#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#####	#DIV/0!	#DIV/0!	####	**#DIV/0!**	**#DIV/0!**

8 SEM SUB CODE: 18ECI85 **SMN** **SUB NAME: Internship**

		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1		2		2		2								2	
CO2											2		2		
CO3										2	3		2		
CO4				2		2					2				2
CO5		2									2				
CO6															
Final_CO_one_row		2	#DIV/0!	2	#DIV/0!	2	#DIV/0!		#DIV/0!	2	2.25	#DIV/0!	2	**2**	**2**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
I SEMESTER															
15MAT11	2.7	2.2	2.2									1.8			
15PHY12	2	1.6	0	1	1	1						1			
15CIV13	2.6	1.8													
15EME14	3	1.5	0	0	1	1	1	0	0	1		1.6			
15ELE15	3	2.17	1.67	0	0	0	0	0	0	0	0	0	3	2.83	1
15EWSL16	2.4	1.3	1	0	0	1	1	0	0	1	1	1			
15PHYL17	1.8	1	1	0	0	1						1			
II SEMESTER															
15MAT21	2.7	2.8	1.7									1.8			
15CHE22	3	2.8	2.2	0	0	0	1.2	0	0	0	0	1	0	0	
15PCD23	2	2	2												
15CED24	2	2	1	1	2	0	0	0	2	2	0	1.5			
15ELN25	3	3	3	3	1.4	1.4									
15CPL26	3	2.7	2.8	0	1	0	0	0	1	0	0	2			
15CHEL27	3	3	2	0	0	0	1.3	0	0	0	0	1			
III SEMESTER															
15MAT31	3	3	3	2	1	0	1	0	1	1	0	3	2	2.2	0
15EE32	2.9	2.9	2	1.3	1.2	0	0	0	0	0	0	0	3	1.6	1
15EE33	2.5	2	2	2.3	0	0.2	0.3	0	0	0	0	3	1.7	3	1
15EE34	3	3	2	1	0	0	0	0	0	0	0	0	3	3	0
15EE35	3	2.8	2.4	2	0	0	0	0	0	0	0	0	3	3	0
15EE36	3	3	2.3	2.5	0	0	0	0	0	0	0	20	3	2.7	0
15EEL37	3	2	0	3	0	2	0	0	3	1	1	1	3	2	1
15EEL38	3	3	2.5	2.5	3	2	0	0	3	2	2.7	1	3	2	0
IV SEMESTER															
15MAT41	3	3	3	2	1	0	1	0	1	1	2	3	2	2.2	0
15EE42	3	2.7	2.8	1	1	0	0	0	0	0	0	0	3	2.7	2
15EE43	3	2.5	3	0	2	1.8	2	0	0	0	1	0	2.5	1.5	0
15EE44	2.7	2	1.7	1	1	1	0	1	1.5	1	1	1	2.5	1.3	1
15EE45	2.2	1.8	1.3	2	2	1	0	0	0	1	0	1.5	3	3	3
15EE46	3	3	2	1	0	0	0	0	0	0	0	0	3	3	0
15EEL47	3	2	0	3	0	2	0	0	3	1	1	1	3	2	1
15EEL48	3	3	2.5	2.5	3	2	0	0	3	2	2.7	1	3	2	0
V SEMESTER															
15EE51	0.82	0.82	0.82	0	0	0	0	2.88	0	0	0	0	0.82	0.94	0
15EE52	3	2.6	1.8	2.2	2								2.2	2	2
15EE53	3	2	2.2	2.3	1	1	0	0	0	0	0	0	3	2.5	0
15EE54	2.7	1.8	1.5	2.3	1.3	1.3	2	0	0	1	0	1	2.7	2	1
15EC562	2.3	2.2	3	2.7	1	0	0	0	0	0	0	2.7	0	2.3	0
15EE563	3	2	3	0	0	0	3	0	0	0	0	0	0	3	3
15EEL57	2	2.7	2.8	2	2	0	0	0	3	0	0	0	2	2.2	0
15EEL58	3	1.7	2.7	2.7	2	2	2	2.3	1	1	1	2	2	2.3	1
VI SEMESTER															
15EE61	3	2.7	2.2	2.2									2		
15EE62	3	2.8	2.2	2.2	0	0	0	0	0	0	1	1	2.7	2.5	1
15EE63	3	3	2.3	2.5	0	0	0	0	1	0	1	2	2.5	2.7	
15EE64	1.8	1.8	2.3	1	1	0	0	0	0	0	0	0	2.3	2.3	1
15EE654	2.42	2.28	1.79	1.91	0	0	0	0	0	0	0.73	0.7	2	2.11	0.9
15EE662	2.5	2	2	2.3	0	1	1	0	0	0	0	0	0	0	3
15CS664	2.8	2.5	2.3	1.2	1	0	0	0	0	0	0	1	3	2.8	0
15EEL67	3	3	2.5	2.5	3	2	0	0	3	2	2.7	1	3	2	0
15EEL68	3	2.2	1.5	1.2	1.8								2.6	1.6	2
VII SEMESTER															
15EE71	3	2.8	2.2	2.3	3	0	0	0	0	0	1	1	2.7	2.5	1
15EE72	3	3	3	1	0	0	0	0	0	0	0	0	3	3	0
15EE73	2.34	2.34	1.68	1.83	1.59	0.8	0	0	0.74	0	0.8	0.9	1.94	2.08	0.8
15EE744	2.5	1.8	2.2	0	0	2.6	2.3	0	0	0	0	2	2.5	1.5	1.3
15EE752	2.5	2	2	2.3	0	1	1	0	0	0	0	0			3
1EEL76	2.1	1.2	1.98	1.35	0.9	0.9	0	0	0	0	0	0	1.95	1.8	0
15EEL77	2.3	1.3	2.2	1	1	1							2.2	2	0
15EEP78	3	3	2.5	2.8	2.8	1.8	2	1.8	3	3	2.8	3	2.7	2.5	0
VIII SEMESTER															
15EE81	3	2.8	2.2	2.3	3	0	0	0	0	0	1	1	2.7	2.5	1
15EE82	3	3	2.5	2.5	0	2	0	0	1	1	2	2.8	2.5	2.7	1
15EE831	3	2.3	2.8	2	3	2	2.3	2	1.3	2	2	2.3	2	2.2	2.3
15EE84	2.3	1.5	1.2	3	1.5	1.2	1.2	1.3	2.5	2.3	2.5	3	2	1.5	0

15EEP85	3	3	2.5	2.8	2.8	1.8	2	1.8	3	3	2.8	3	2.7	2.5	0
15EES86	2.3	1.5	1.2	3	1.5	1.2	1.2	1.3	2.5	2.3	2.5	3	2	1.5	0

Department of EEE

Course Outcomes (2015 SCHEME)

I & II SEMESTER

15MAT11 Engineering Mathematics-I	CO1	Use partial derivatives to calculate rates of change of multivariate functions.
	CO2	Analyze position, velocity, and acceleration in two or three dimensions using the calculus of vector valued functions.
	CO3	Recognize and solve first-order ordinary differential equations, Newton's law of cooling
	CO4	Use matrices techniques for solving systems of linear equations in the different areas of Linear Algebra.

15MAT21 Engineering Mathematics-II	CO1	Evaluate double and triple integrals to find area, volume, mass and moment of inertia of plane and solid region. Use curl and divergence of a vector valued functions in various applications of electricity, magnetism and fluid flows.
	CO2	Solve differential equations of electrical circuits, forced oscillation of mass spring and elementary heat transfer
	CO3	solve partial differential equations fluid mechanics, electromagnetic theory and heat transfer
	CO4	Use Laplace transforms to determine general or complete solutions to linear ODE

15PHY12/15PHY22 ENGINEERING PHYSICS	CO1	Learn and understand more about basic principles and to develop problem solving skills and implementation in technology.
	CO2	Gain Knowledge about Modern physics and quantum mechanics will update the basic concepts to implement the skills
	CO3	Study of material properties and their applications is the prime role to understand and use in engineering applications and studies.
	CO4	Study Lasers and Optical fibers and its applications are to import knowledge and to develop skills and to use modern instruments in the engineering applications.
	CO5	Understand Crystal structure and applications are to boost the technical skills and its applications.

15CHE12/15CHE22 ENGINEERING CHEMISTRY	CO1	Electrochemical and concentration cells. Classical & modern batteries and fuel cells.
	CO2	Causes & effects of corrosion of metals and control of corrosion. Modification of surface properties of metals to develop resistance to corrosion, wear, tear, impact etc. by electroplating and electro less plating.
	CO3	Production & consumption of energy for industrialization of country and living standards of people. Utilization of solar energy for different useful forms of energy.
	CO4	Replacement of conventional materials by polymers for various applications.
	CO5	Boiler troubles; sewage treatment and desalination of sea water,
15CIV13/23 Elements of Civil Engineering and Mechanics	CO1	Mention the applications of various fields of Civil Engineering.
	CO2	Compute the resultant of given force system subjected to various loads.
	CO3	Comprehend the action of Forces, Moments and other loads on systems of rigid bodies and compute the reactive forces that develop as a result of the external loads.
	CO4	Locate the Centroid and compute the Moment of Inertia of regular and built-up sections
	CO5	. Express the relationship between the motion of bodies and analyze the bodies in motion.

15PCD13/23 Programming in C and Data Structures	CO1	Achieve Knowledge of design and development of C problem solving skills.
	CO2	Understand the basic principles of Programming in C language
	CO3	Design and develop modular programming skills.
	CO4	Effective utilization of memory using pointer technology

15CED14/24 Computer Aided Engineering Drawing	CO1	Students will be able to demonstrate the usage of CAD software.
	CO2	Students will be able to visualize and draw Orthographic projections, Sections of solids and Isometric views of solids.
	CO3	Students are evaluated for their ability in applying various concepts to solve practical problems related to engineering drawing

15EME14/24 Elements of Mechanical Engineering	CO1	Various Energy sources, Boilers, Prime movers such as turbines and IC engines, refrigeration and air-conditioning system
	CO2	Metal removal process using Lathe, drilling, Milling Robotics and Automation

	CO3	Fair understanding of application and usage of various engineering materials.

15ELE15/25 Basic Electrical Engineering	CO1	To predict the behaviour of electrical and magnetic circuits.
	CO2	Practice Electrical Safety Rules & standards.
	CO3	Realize the requirement of transformers in transmission and distribution of electric power and other applications
	CO4	Select the type of generator / motor required for a particular application.

15ELN15/25 Basic Electronics	CO1	Appreciate the significance of electronics in different applications,
	CO2	Understand the applications of diode in rectifiers, filter circuits and wave shaping
	CO3	Apply the concept of diode in rectifiers, filters circuits
	CO4	Design simple circuits like amplifiers (inverting and non inverting), comparators, adders, integrator and differentiator using OPAMPS,
	Co5	Compile the different building blocks in digital electronics using logic gates and implement simple logic function using basic universal gates,

15PHYL17/27 Engg. Physics Lab	CO1	Develop skills to impart practical knowledge in real time solution
	CO2	Understand principle, concept, working and application of new technology and comparison of results with theoretical calculations
	CO3	Design new instruments with practical knowledge.
	CO4	Gain knowledge of new concept in the solution of practical oriented problems and to understand more deep knowledge about the solution to theoretical problems.
	CO5	Understand measurement technology, usage of new instruments and real time applications in engineering studies.

15CHEL17/27 Chemistry Lab	CO1	Handling different types of instruments for analysis of materials using small quantities of materials involved for quick and accurate results, and
	CO2	Carrying out different types of titrations for estimation of concerned in materials using comparatively more quantities of materials involved for good results

15WSL16/26 Workshop Practice	CO1	Gain knowledge of development of sheet metal models with an understanding of their applications
	CO2	Demonstrate and produce different types of fitting models.
	CO3	Perform soldering and welding of different sheet metal & welded joints
	CO4	Understand the Basics of Workshop practices

15CPL16/26 Computer Programming lab	CO1	Gaining Knowledge on various parts of a computer.
	CO2	Able to draw flowcharts and write algorithms
	CO3	Able design and development of C problem solving skills.
	CO4	Able design and develop modular programming skills.

15CIV18/15CIV28 Environmental studies	CO1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,
	CO2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment,
	CO3	Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components
	CO4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues

III SEMESTER

15MAT31 ENGINEERING MATHEMATICS –III	CO1	Know the use of periodic signals and Fourier series to analyze circuits and system communications.
	CO2	Explain the general linear system theory for continuous-time signals and digital signal processing using the Fourier Transform and z-transform.
	CO3	Apply Green's Theorem, Divergence Theorem and Stokes' theorem in various applications in the field of electro-magnetic and gravitational fields and fluid flow problems.
	CO4	Determine the externals of functional and solve the simple problems of the calculus
	CO5	Employ appropriate numerical methods to solve algebraic and transcendental equations. Determine the extremals of functional and solve the simple problems of the calculus of variations.

15EE32 ELECTRIC CIRCUIT ANALYSIS	CO1	Apply knowledge of mathematics, science, and engineering to the analysis and design of electrical circuits.
	CO2	Identify, formulate, and solve engineering problems in the area circuits and systems
	CO3	Analyze the solution and infer the authenticity of it.

15EE33 TRANSFORMERS AND GENERATORS	CO1	Explain the construction and operation and performance of transformers. Explain different connections for the three phase operations, their advantages and applications.
	CO2	Explain the construction and operation of Synchronous machines and evaluate the regulation of synchronous machines by different methods.
	CO3	Analyze the operation of the synchronous machine connected to infinite machine.
15EE34 ANALOG ELECTRONIC CIRCUITS	CO1	Utilize the characteristics of transistor for different applications.
	CO2	Design and analyze biasing circuits for transistor.
	CO3	Design, analyze and test transistor circuitry as amplifiers and oscillators

15EE35 DIGITAL SYSTEM DESIGN	CO1	Design and analyze combinational & sequential circuits
	CO2	Design circuits like adder, sub tractor, code converter etc
	CO3	Understand counters and sequence generators.

15EE36 ELECTRICAL AND ELECTRONIC MEASUREMENTS	CO1	Measure resistance, inductance and capacitance using bridges and determine earth resistance.
	CO2	Explain the working of various meters used for measurement of Power, Energy & understand the adjustments, calibration & errors in energy meters.
	CO3	Understand methods of extending the range of instruments & instrument transformers
	CO4	Explain the working of different electronic instruments.
	CO5	Explain the working of different display and recording devices.

15EEL37 ELECTRICAL MACHINES LABORATORY - 1	CO1	Conduct different tests on transformers and synchronous generators and evaluate their performance
	CO2	Connect and operate two single phase transformers of different KVA rating in parallel
	CO3	Connect single phase transformers for three phase operation and phase conversion.
	CO4	Assess the performance of synchronous generator connected to infinite bus
15EEL38 ELECTRONICS LABORATORY	CO1	Design and test rectifier circuits with and without capacitor filters.
	CO2	Determine h-parameter models of transistor for all modes.
	CO3	Design and test BJT and FET amplifier and oscillator circuits.
	CO4	Realize Boolean expressions, adders and subtractors using gates

IV SEMESTER

15EE41 ENGINEERING MATHEMATICS –IV	CO1	Use appropriate single step and multi-step numerical methods to solve first and second order ordinary differential equations arising in flow data design problems
	CO2	Explain the idea of analyticity, potential fields residues and poles of complex potentials in field theory and electromagnetic theory.
	CO3	Employ Bessel's functions and Legendre's polynomials for tackling problems arising in continuum mechanics, hydrodynamics and heat conduction.
	CO4	. Describe random variables and probability distributions using rigorous statistical methods to analyze problems associated with

		optimization of digital circuits, information, coding theory and stability analysis of systems.
	CO5	Apply the knowledge of joint probability distributions and Markov chains in attempting engineering problems for feasible random event

15EE42 POWER GENERATION AND ECONOMICS	CO1	Describe the working of hydroelectric, steam, nuclear power plants and state functions of major equipment of the power plants.
	CO2	Classify various substations and explain the functions of major equipments in substations
	CO3	Explain the types of grounding and its importance.
	CO4	Infer the economic aspects of power system operation and its effects.
	CO5	Explain the importance of power factor improvement.

15EE43 TRANSMISSION AND DISTRIBUTION	CO1	Explain the concepts of various methods of generation of power.
	CO2	Explain the importance of HVAC, EHVAC, UHVAC and HVDC transmission
	CO3	Design and analyze overhead transmission system for a given voltage level
	CO4	Calculate the parameters of the transmission line for different configurations and assess the performance ofline
	CO5	Explain the use of underground cables and evaluate different types of distribution systems

15EE44 ELECTRIC MOTORS	CO1	Explain the constructional features of Motors and select a suitable drive for specific application.
	CO2	Analyze and assess the performance characteristics of DC motors by conducting suitable tests and control the speed by suitable method
	CO3	. Explain the constructional features of Three Phase and Single phase induction Motors and assess their performance.
	CO4	Control the speed of induction motor by a suitable method.
	CO5	Explain the operation of Synchronous motor and special motors

15EE45 ELECTROMAGNETIC FIELD THEORY	CO1	Use different coordinate systems , Coulomb's Law and Gauss Law for the evaluation of electric fields produced by different charge configurations.
	CO2	Calculate the energy and potential due to a system of charges & Explain the behavior of electric field across a boundary conditions.
	CO3	Explain the Poisson's, Laplace equations and behavior of steady magnetic fields.
	CO4	Explain the behavior of magnetic fields and magnetic materials
	CO5	Asses time varying fields and propagation of waves in different media.

15EE46 OPERATIONAL AMPLIFIERS AND LINEAR ICs	CO1	Explain the basics of linear ICs.
	CO2	Design circuits using linear ICs.
	CO3	Demonstrate the application of Linear ICs.
	CO4	Use ICs in the electronic projects

15EEL47 ELECTRICAL MACHINES LABORATORY - 2	CO1	Test DC machines to determine their characteristics and also to control the speed of DC motor
	CO2	Pre-determine the performance characteristics of DC machines by conducting suitable tests
	CO3	Perform load test on single phase and three phase induction motor to assess its performance
	CO4	Conduct test on induction motor to pre-determine the performance characteristics
	CO5	Conduct test on synchronous motor to draw the performance curves.

15EEL48 OP- AMP AND LINEAR ICS LABORATORY	CO1	To conduct experiment to determine the characteristic parameters of OP-Amp
	CO2	To design test the OP-Amp as Amplifier, adder, subtractor, differentiator and integrator
	CO3	To design test the OP-Amp as oscillators and filters.
	CO4	Design and study of Linear IC's as multivibrator power supplies.

V SEMESTER

15EE51 MANAGEMENT AND ENTREPRENEURSHIP	CO1	Explain the field of management, task of the manager, planning and the need of proper staff, recruitment and selection process.
	CO2	Discuss work allocation, the structure of organization, the modes of communication and importance of managerial control in business.
	CO3	To explain need of coordination between the manager and staff in exercising the authority and delegating duties.
	CO4	To explain the social responsibility of business and leadership
	CO5	Explain the concepts of entrepreneurship and the role and importance of the entrepreneur in economic development.

15EE52 MICROCONTROLLER	CO1	Discuss the history of the 8051 and features of other 8051 family members and the internal architecture of the 8051.
	CO2	Discuss 8051 addressing modes, instruction set of 8051, accessing data and I/O port programming.
	CO3	Develop 8051C programs for time delay, I/O operations, I/O bit manipulation, logic and arithmetic operations, data conversion and timer/counter programming.
	CO4	Summarize the basics of serial communication and interrupts, also develop 8051 programs for serial data communication and interrupt programming.
	CO5	Discuss in detail 8051 interrupts and writing interrupt handler programs. Interface 8051 with real-world devices such as LCDs and keyboards, ADC, DAC chips and sensors Interface 8031/51 with external memories, 8255 chip to add ports and relays, opt isolators and motors

15EE53 POWER ELECTRONICS	CO1	Explain application area of power electronics, types of power electronic circuits and switches their characteristics and specifications. Explain designing, analysis techniques and characteristics of thyristor controlled rectifiers
	CO2	. Explain types of power diodes, their characteristics, and the effects of power diodes on RL circuits
	CO3	Explain the techniques for design, operation and analysis of single phase diode rectifier circuits
	CO4	Explain steady state, switching characteristics and gate control requirements of different power transistors and their limitations.
	CO5	Discuss different types of Thyristors, their operation, gate characteristics and gate control requirements. Discuss the principle of operation of single phase and three phase DC - DC, DC –AC converters and AC voltage controllers

15EE54 SIGNALS AND SYSTEMS	CO1	Classify the signals and systems. Explain basic operations on signals and properties of systems. Apply discrete time Fourier transform representation to study signals and linear time invariant systems.
	CO2	Use convolution in both continuous and discrete domain for the analysis of systems given the impulse response of a system.
	CO3	Evaluate response of a given linear time invariant system.
	CO4	Provide block diagram representation of a linear time invariant system
	CO5	Apply continuous time Fourier transform representation to study signals and linear time invariant systems. Use Z-transform and properties of Z transform for the analysis of discrete time systems

15EE552 ELECTRICAL	CO1	Discuss electrical and electronics materials, their importance, classification and operational requirement
	CO2	Discuss conducting materials used in engineering, their properties

ENGINEERING MATERIALS Professional elective		and classification. Discuss dielectric materials used in engineering, their properties and classification. Discuss insulating materials used in engineering, their properties and classification
	CO3	Explain the phenomenon superconductivity, super conducting materials and their application in engineering.
	CO4	Explain the plastic and its properties and applications.
	CO5	Discuss materials used for Opto electronic devices

15EE563 RENEWABLE ENERGY RESOURCES Open elective	CO1	Discuss causes of energy scarcity and its solution, energy resources and availability of renewable Discus generation of energy from hydrogen, wind, geothermal system, solid waste and agriculture refuse.
	CO2	Discuss energy from sun, energy reaching the Earth's surface and solar thermal energy applications.
	CO3	Discuss types of solar collectors, their configurations, solar cell system, its characteristics and their applications.
	CO4	Discuss production of energy from biomass, biogas.
	CO5	Discuss tidal energy resources, energy availability and power generation

15EEL57 MICROCONTROLLER LABORATORY	CO1	Write assembly language programs for data transfer, arithmetic, Boolean and logical instructions and code conversions.
	CO2	Write ALP using subroutines for generation of delays, counters, configuration of SFRs for serial communication and timers.
	CO3	Perform interfacing of stepper motor and dc motor for controlling the speed, elevator, LCD, external ADC and temperature control.
	CO4	Generate different waveforms using DAC interface
	CO5	Work a small team to carryout experiments using microcontroller concepts and prepare reports that present lab work

15EEL58 POWER ELECTRONICS LABORATORY	CO1	Obtain static characteristics of semiconductor devices to discuss their performance.
	CO2	Trigger the SCR by different methods
	CO3	Verify the performance of single phase controlled full wave rectifier and AC voltage controller with R and RL loads
	CO4	Control the speed of a DC motor, universal motor and stepper motors
	CO5	Verify the performance of single phase full bridge inverter connected to resistive load

VI SEMSTER

15EE61 CONTROL SYSTEMS	CO1	Discuss the effects of feedback and types of feedback control systems.
	CO2	Evaluate the transfer function of a linear time invariant system.
	CO3	Evaluate the stability of linear time invariant systems Apply block diagram manipulation and signal flow graph methods to obtain transfer function of systems.
	CO4	Demonstrate the knowledge of mathematical modeling of control systems and components
	CO5	Determine transient and steady state time response of a simple control system

15EE62 POWER SYSTEM ANALYSIS-– 1	CO1	Show understanding of per unit system, its advantages and computation.
	CO2	Show the concept of one line diagram and its implementation in problems
	CO3	Perform short circuit analysis on a synchronous machine and simple power system to select a circuit breaker for the system.
	CO4	Evaluate symmetrical components of voltages and currents in un-balanced three phase circuits.
	CO5	Analyze three phase synchronous machine and simple power systems for different unsymmetrical faults using symmetrical components Discuss the dynamics of synchronous machine, stability and types of stability. Discuss equal area criterion for the evaluation of stability of a simple system under different fault conditions.

15EE63 DIGITAL SIGNAL PROCESSING	CO1	Compute the DFT of various signals using its properties and linear filtering of two sequences.
	CO2	Apply fast and efficient algorithms for computing DFT and inverse DFT of a given sequence. Design infinite impulse response Butterworth digital filters using impulse invariant / bilinear transformation technique
	CO3	Design infinite impulse response Chebyshev digital filters using impulse invariant or bilinear• transformation technique. Realize a digital IIR filter by direct, cascade, parallel and ladder methods of realization
	CO4	Discuss different window functions and frequency sampling method

		used for design of FIR filters
	CO5	Design FIR filters by use of window function or by frequency sampling method Realize a digital FIR filter by direct, cascade, and linear phase form.

15EE64 ELECTRICAL MACHINE DESIGN	CO1	Discuss design factors, limitations, modern trends in design, manufacturing of electrical machines and properties of materials used in the electrical machines.
	CO2	Derive the output equations of transformer, DC machines and AC machines
	CO3	Discuss selection of specific loadings and magnetic circuits of different electrical machines Design the field windings of DC machine and Synchronous machine
	CO4	Design stator and rotor circuits of a DC and AC machines. Discuss short circuit ratio and its effects on performance of synchronous machines. Design salient pole and non-salient pole alternators for given specifications.•

15EE654 SOLAR AND WIND ENERGY Professional elective	CO1	Discuss the importance of energy in human life, relationship among economy and environment with energy use and the increasing role of renewable energy.
	CO2	Explain the concept of energy storage and the principles of energy storage devices
	CO3	To discuss solar radiation on horizontal and tilted surface, its characteristics, measurement and analysis of radiation data. Describe the process of harnessing solar energy and its applications in heating and cooling
	CO4	Discuss fabrication, operation of solar cell, electrical characteristics, sizing and design of solar PV systems and their applications
	CO5	Discuss the performance of Wind-machines, energy storage, applications of Wind Energy and environmental aspects
15EE662 SENSORS AND TRANSDUCERS(Open Elective)	CO1	Discuss need of transducers, their classification, advantages and disadvantages. Show an understanding of working of various transducers and sensors.
	CO2	Discuss recent trends in sensor technology and their selection
	CO3	Discuss basics of signal conditioning and signal conditioning equipment
	CO4	Discuss configuration of Data Acquisition System and data conversion
	CO5	Show an understanding of working of various transducers and sensors.

15EEL67 CONTROL SYSTEM LABORATORY	CO1	Utilize software package and discrete components in assessing the time and frequency domain response of a given second order system.
	CO2	Design, analyze and simulate Lead, Lag and Lag – Lead compensators for given specifications.
	CO3	Determine the performance characteristics of ac and DC servomotors and synchro-transmitter receiver pair used in control systems.
	CO4	Simulate the DC position and feedback control system to study the effect of P, PI, PD and PID controller and Lead compensator on the step response of the system
	CO5	Develop a script files to plot Root locus, Bode plot and Nyquist plot to study the stability. Work with a small team to carryout experiments and prepare reports that present lab work.

15EEL68 DIGITAL SIGNAL PROCESSING LABORATORY	CO1	Explain physical interpretation of sampling theorem in time and frequency domains.
	CO2	Evaluate the impulse response of a system
	CO3	Perform convolution of given sequences to evaluate the response of a system.
	CO4	Compute DFT and IDFT of a given sequence using the basic definition and/or fast methods
	CO5	Provide a solution for a given difference equation.Design and implement IIR and FIR filters.

VII SEMESTER

15EE71 POWER SYSTEM ANALYSIS – 2	CO1	Discuss optimal scheduling for hydro-thermal system, power system security and reliability.
	CO2	Analyze short circuit faults in power system networks using bus impedance matrix
	CO3	Perform numerical solution of swing equation for multi-machine stability

15EE72 POWER SYSTEM PROTECTION	CO1	Discuss performance of protective relays, components of protection scheme and relay terminology over current protection.
	CO2	Explain the working of distance relays and the effects of arc resistance, power swings, line length and source impedance on performance of distance relays.
	CO3	Discuss pilot protection, construction, operating principles and performance ofdifferential relays and discuss protection of generators, motors, transformer and Bus Zone Protection.
	CO4	Explain the construction and operation of different types of circuit breakers
	CO5	Outline features of fuse, causes of overvoltages and its protection, also modern trends in Power System Protection.14

15EE73 HIGH VOLTAGE ENGINEERING	CO1	Explain conduction and breakdown phenomenon in gases, liquid dielectrics.
	CO2	Explain breakdown phenomenon in solid dielectrics
	CO3	Explain generation of high voltages and currents
	CO4	Discuss measurement techniques for high voltages and currents.
	CO5	Discuss overvoltage phenomenon and insulation coordination in electric power systems

15EE742 UTILIZATION OF ELECTRICAL POWER (PROFESSIONAL ELECTIVE)	CO1	Discuss different methods of electric heating & welding.
	CO2	Discuss the laws of electrolysis, extraction, refining of metals and electro deposition process.
	CO3	Discuss the laws of illumination, different types of lamps, lighting schemes and design of lighting systems.
	CO4	Explain the motors used for electric traction, their control & braking and power supply system used for electric traction.
	CO5	Analyze systems of electric traction, speed time curves and mechanics of train movement.

15EE752 TESTING AND COMMISSIONING OF POWER	CO1	Describe the process to plan, control and implement commissioning of electrical equipment's.
	CO2	Differentiate the performance specifications of transformer and induction motor

SYSTEM APPARATUS	CO3	Demonstrate the routine tests for synchronous machine, induction motor, transformer• & switchgears.
	CO4	Describe corrective and preventive maintenance of electrical equipment's
	CO5	Explain the operation of an electrical equipment's such as isolators, circuit breakers, induction motor• and synchronous machines.

15EEL76 POWER SYSTEM SIMULATION LABORATORY	CO1	Develop a program in MATLAB to assess the performance of medium and long transmission lines. Develop a program in MATLAB to assess the transient stability under three phase fault at different locations in a of radial power systems.
	CO2	Develop a program in MATLAB to obtain the power angle characteristics of salient and non-salient pole alternator.
	CO3	Develop programs in MATLAB to formulate bus admittance and bus impedance matrices of interconnected power systems
	CO4	Use Mi-Power package to solve power flow problem for simple power systems
	CO5	Use Mi-Power package to study unsymmetrical faults at different locations in radial power systems

15EEL77 RELAY AND HIGH VOLTAGE LABORATORY	CO1	Experimentally verify the characteristics of over current, over voltage, under voltage and negative sequence relays both electromagnetic and static type
	CO2	Experimentally verify the characteristics of microprocessor based over current, over voltage, under voltage relays and distance relay.
	CO3	. Show knowledge of protecting generator, motor and feeders.
	CO4	Analyze the spark over characteristics for both uniform and non-uniform configurations using High AC and DC voltages.
	CO5	Measure high AC and DC voltages and breakdown strength of transformer oil.
15EEP78 PROJECT PHASE – I and Seminar	CO1	Demonstrate a sound technical knowledge of their selected project topic.
	CO2	Undertake problem identification, formulation and solution
	CO3	Design engineering solutions to complex problems utilizing a systems approach
	CO4	Communicate with engineers and the community at large in written an oral forms.

VIII SEMESTER

15EE81 POWER SYSTEM OPERATION AND CONTROL	CO1	Describe various levels of controls in power systems, the vulnerability of the system, components, architecture and configuration of SCADA.
	CO2	Solve unit commitment problems
	CO3	Explain issues of hydrothermal scheduling and solutions to hydro thermal problems
	CO4	Explain basic generator control loops, functions of Automatic generation control, speed governors
	CO5	Develop and analyze mathematical models of Automatic Load Frequency Control

15EE82 INDUSTRIAL DRIVES AND APPLICATIONS	CO1	Explain the advantages and choice of electric drive
	CO2	Explain dynamics and different modes of operation of electric drives.
	CO3	Suggest a motor for a drive and control of dc motor using controlled rectifiers
	CO4	Analyze the performance of induction motor drives under different conditions
	CO5	Control induction motor, synchronous motor and stepper motor drives

15EE831 SMART GRID(Professional Elective)	CO1	Discuss the progress made by different stakeholders in the design and development of smart grid
	CO2	Explain measurement techniques using Phasor Measurement Units and smart meters
	CO3	Discuss tools for the analysis of smart grid and design, operation and performance
	CO4	Discuss classical optimization techniques and computational methods for smart grid design, planning and operation.
	CO5	Explain predictive grid management and control technology for enhancing the smart grid performance

15EE84 INTERNSHIP / PROFESSIONAL PRACTICE	CO1	Gain practical experience within industry in which the internship is done.
	CO2	Acquire knowledge of the industry in which the internship is done.
	CO3	Apply knowledge and skills learned to classroom work.
	CO4	Develop a greater understanding about career options while more clearly defining personal career goals
	CO5	Experience the activities and functions of professionals.

15EEP85 PROJECT	CO1	Present the project and be able to defend it.
	CO2	Make links across different areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills

WORK PHASE -II		to the project task.
	CO3	Communicate effectively and to present ideas clearly and coherently in both the written and oral forms.
	CO4	Work in a team to achieve common goal.
	CO5	Habituated to critical thinking and use problem solving skills

15EES86 SEMINAR	CO1	Attain, use and develop knowledge in the field of electrical and electronics engineering and other disciplines through independent learning and collaborative study.
	CO2	Identify, understand and discuss current, real-time issues
	CO3	Improve oral and written communication skills
	CO4	Explore an appreciation of the self in relation to its larger diverse social and academic contexts

Department of EEE

Course Outcomes (2017 SCHEME)

I & II SEMESTER

17MAT11 Engineering Mathematics-I	CO1	Use partial derivatives to calculate rates of change of multivariate functions.
	CO2	Analyze position, velocity, and acceleration in two or three dimensions using the calculus of vector valued functions.
	CO3	Recognize and solve first-order ordinary differential equations, Newton's law of cooling
	CO4	Use matrices techniques for solving systems of linear equations in the different areas of Linear Algebra.

17MAT21 Engineering Mathematics-II	CO1	Evaluate double and triple integrals to find area, volume, mass and moment of inertia of plane and solid region. Use curl and divergence of a vector valued functions in various applications of electricity, magnetism and fluid flows.
	CO2	Solve differential equations of electrical circuits, forced oscillation of mass spring and elementary heat transfer
	CO3	solve partial differential equations fluid mechanics, electromagnetic theory and heat transfer
	CO4	Use Laplace transforms to determine general or complete solutions to linear ODE

17PHY12/17PHY22 ENGINEERING PHYSICS	CO1	Learn and understand more about basic principles and to develop problem solving skills and implementation in technology.
	CO2	Gain Knowledge about Modern physics and quantum mechanics will update the basic concepts to implement the skills
	CO3	Study of material properties and their applications is the prime role to understand and use in engineering applications and studies.
	CO4	Study Lasers and Optical fibers and its applications are to import knowledge and to develop skills and to use modern instruments in the engineering applications.
	CO5	Understand Crystal structure and applications are to boost the technical skills and its applications.

17CHE12/17CHE22 ENGINEERING CHEMISTRY	CO1	Electrochemical and concentration cells. Classical & modern batteries and fuel cells.
	CO2	Causes & effects of corrosion of metals and control of corrosion. Modification of surface properties of metals to develop resistance to corrosion, wear, tear, impact etc. by electroplating and electro less plating.
	CO3	Production & consumption of energy for industrialization of country and living standards of people. Utilization of solar energy for different useful forms of energy.
	CO4	Replacement of conventional materials by polymers for various applications.
	CO5	Boiler troubles; sewage treatment and desalination of sea water,
17CIV13/23 Elements of Civil Engineering and Mechanics	CO1	Mention the applications of various fields of Civil Engineering.
	CO2	Compute the resultant of given force system subjected to various loads.
	CO3	Comprehend the action of Forces, Moments and other loads on systems of rigid bodies and compute the reactive forces that develop as a result of the external loads.
	CO4	Locate the Centroid and compute the Moment of Inertia of regular and built-up sections
	CO5	. Express the relationship between the motion of bodies and analyze the bodies in motion.

17PCD13/23 Programming in C and Data Structures	CO1	Achieve Knowledge of design and development of C problem solving skills.
	CO2	Understand the basic principles of Programming in C language
	CO3	Design and develop modular programming skills.
	CO4	Effective utilization of memory using pointer technology

17PCD13/23 Computer Aided Engineering Drawing	CO1	Students will be able to demonstrate the usage of CAD software.
	CO2	Students will be able to visualize and draw Orthographic projections, Sections of solids and Isometric views of solids.
	CO3	Students are evaluated for their ability in applying various concepts to solve practical problems related to engineering drawing

17EME14/24 Elements of Mechanical Engineering	CO1	Various Energy sources, Boilers, Prime movers such as turbines and IC engines, refrigeration and air-conditioning system
	CO2	Metal removal process using Lathe, drilling, Milling Robotics and Automation

	CO3	Fair understanding of application and usage of various engineering materials.

17ELE15/25 Basic Electrical Engineering	CO1	To predict the behaviour of electrical and magnetic circuits.
	CO2	Practice Electrical Safety Rules & standards.
	CO3	Realize the requirement of transformers in transmission and distribution of electric power and other applications
	CO4	Select the type of generator / motor required for a particular application.

17ELN15/25 Basic Electronics	CO1	Appreciate the significance of electronics in different applications,
	CO2	Understand the applications of diode in rectifiers, filter circuits and wave shaping
	CO3	Apply the concept of diode in rectifiers, filters circuits
	CO4	Design simple circuits like amplifiers (inverting and non inverting), comparators, adders, integrator and differentiator using OPAMPS,
	Co5	Compile the different building blocks in digital electronics using logic gates and implement simple logic function using basic universal gates,

17PHYL17/27 Engg. Physics Lab	CO1	Develop skills to impart practical knowledge in real time solution
	CO2	Understand principle, concept, working and application of new technology and comparison of results with theoretical calculations
	CO3	Design new instruments with practical knowledge.
	CO4	Gain knowledge of new concept in the solution of practical oriented problems and to understand more deep knowledge about the solution to theoretical problems.
	CO5	Understand measurement technology, usage of new instruments and real time applications in engineering studies.

17CHEL17/27 Chemistry Lab	CO1	Handling different types of instruments for analysis of materials using small quantities of materials involved for quick and accurate results, and
	CO2	Carrying out different types of titrations for estimation of concerned in materials using comparatively more quantities of materials involved for good results

17WSL16/26 Workshop Practice	CO1	Gain knowledge of development of sheet metal models with an understanding of their applications
	CO2	Demonstrate and produce different types of fitting models.
	CO3	Perform soldering and welding of different sheet metal & welded joints
	CO4	Understand the Basics of Workshop practices

17CPL16/26 Computer Programming lab	CO1	Gaining Knowledge on various parts of a computer.
	CO2	Able to draw flowcharts and write algorithms
	CO3	Able design and development of C problem solving skills.
	CO4	Able design and develop modular programming skills.

17CIV18/17CIV28 Environmental studies	CO1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,
	CO2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment,
	CO3	Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components
	CO4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues

III SEMESTER

17MAT31 ENGINEERING MATHEMATICS –III	CO1	Know the use of periodic signals and Fourier series to analyze circuits and system communications.
	CO2	Explain the general linear system theory for continuous-time signals and digital signal processing using the Fourier Transform and z-transform.
	CO3	Apply Green's Theorem, Divergence Theorem and Stokes' theorem in various applications in the field of electro-magnetic and gravitational fields and fluid flow problems.
	CO4	Determine the externals of functional and solve the simple problems of the calculus
	CO5	Employ appropriate numerical methods to solve algebraic and transcendental equations

17EE32 ELECTRIC CIRCUIT ANALYSIS	CO1	Understand the basic concepts, basic laws and methods of analysis of DC and AC networks and reduce the complexity of network using source shifting, source transformation and network reduction using transformations.
	CO2	Solve complex electric circuits using network theorems.
	CO3	Discuss resonance in series and parallel circuits and also the importance of initial conditions and their evaluation
	CO4	Synthesize typical waveforms using Laplace transformation.
	CO5	Solve unbalanced three phase systems and also evaluate the performance of two port networks.

17EE33 TRANSFORMERS AND GENERATORS	CO1	Explain the construction and operation and performance of single phase and three phase transformers.
	CO2	Explain the use of auto transformer, tap changing and tertiary winding transformer and need of operating transformers in parallel.
	CO3	Explain the armature reaction and commutation and their effects in a DC generators
	CO4	Explain the construction, operation and performance of Synchronous machines.
17EE34 ANALOG ELECTRONIC CIRCUITS	CO1	Predict the output characteristics of clipper and clamper circuits.
	CO2	Design and compare biasing circuits for transistor amplifiers & explain the transistor switching
	CO3	Explain the concept of feedback, its types and design of feedback circuits
	CO4	Design and analyze the power amplifier circuits and oscillators for different frequencies
	CO5	Perform Design and analysis of FET and MOSFET amplifiers

17EE35 DIGITAL SYSTEM DESIGN	CO1	Simplify switching equations generated from truth tables. Design combinational logic circuits; adders, Subtractors and comparators
	CO2	Design synchronous sequential circuits; latches, flip-flops, binary counters and Mod – 6 counters.
	CO3	Design Mealy and Moore synchronous sequential circuit models
	CO4	Describe the structure of HDL module, operators,data types.
	CO5	Understand the concept of data-flow description.

17EE36 ELECTRICAL AND ELECTRONIC MEASUREMENTS	CO1	Measure resistance, inductance and capacitance using bridges and determine earth resistance.
	CO2	Explain the working of various meters used for measurement of Power, Energy & understand the adjustments, calibration & errors in energy meters.
	CO3	Understand methods of extending the range of instruments & instrument transformers
	CO4	Explain the working of different electronic instruments.
	CO5	Explain the working of different display and recording devices.

17EEL37 ELECTRICAL MACHINES LABORATORY - 1	CO1	Evaluate the performance of transformers from the test data obtained.
	CO2	Connect and operate two single phase transformers of different KVA rating in parallel.
	CO3	Connect single phase transformers for three phase operation and phase conversion
	CO4	Compute the voltage regulation of synchronous generator using the test data obtained in the laboratory.
	CO5	Evaluate the performance of synchronous generators from the test data and assess the performance of synchronous generator connected to infinite bus
17EEL38 ELECTRONICS LABORATORY	CO1	Design and test rectifier circuits with and without capacitor filters.
	CO2	Determine h-parameter models of transistor for all modes.
	CO3	Design and test BJT and FET amplifier and oscillator circuits.
	CO4	Realize Boolean expressions, adders and subtractors using gates

IV SEMESTER

17EE41 ENGINEERING MATHEMATICS –IV	CO1	Use appropriate single step and multi-step numerical methods to solve first and second order ordinary differential equations arising in flow data design problems
	CO2	Explain the idea of analyticity, potential fields residues and poles of complex potentials in field theory and electromagnetic theory.
	CO3	Employ Bessel's functions and Legendre's polynomials for tackling problems arising in continuum mechanics, hydrodynamics and heat conduction.
	CO4	. Describe random variables and probability distributions using rigorous statistical methods to analyze problems associated with optimization of digital circuits, information, coding theory and stability analysis of systems.
	CO5	Apply the knowledge of joint probability distributions and Markov chains in attempting engineering problems for feasible random event

17EE42 POWER GENERATION AND ECONOMICS	CO1	Describe the working of hydroelectric, steam, nuclear power plants and state functions of major equipment of the power plants.
	CO2	Classify various substations and explain the functions of major equipments in substations
	CO3	Explain the types of grounding and its importance.
	CO4	Infer the economic aspects of power system operation and its effects.
	CO5	Explain the importance of power factor improvement.

17EE43 TRANSMISSION AND DISTRIBUTION	CO1	Explain the concepts of various methods of generation of power.
	CO2	Explain the importance of HVAC, EHVAC, UHVAC and HVDC transmission
	CO3	Design and analyze overhead transmission system for a given voltage level
	CO4	Calculate the parameters of the transmission line for different configurations and assess the performance ofline
	CO5	Explain the use of underground cables and evaluate different types of distribution systems
17EE44 ELECTRIC MOTORS	CO1	Explain the constructional features of Motors and select a suitable drive for specific application.
	CO2	Analyze and assess the performance characteristics of DC motors by conducting suitable tests and control the speed by suitable method
	CO3	. Explain the constructional features of Three Phase and Single phase induction Motors and assess their performance.
	CO4	Control the speed of induction motor by a suitable method.
	CO5	Explain the operation of Synchronous motor and special motors

17EE45 ELECTROMAGNETIC FIELD THEORY	CO1	Use different coordinate systems , Coulomb's Law and Gauss Law for the evaluation of electric fields produced by different charge configurations.
	CO2	Calculate the energy and potential due to a system of charges & Explain the behavior of electric field across a boundary conditions.
	CO3	Explain the Poisson's, Laplace equations and behavior of steady magnetic fields.
	CO4	Explain the behavior of magnetic fields and magnetic materials
	CO5	Asses time varying fields and propagation of waves in different media.

17EE46 OPERATIONAL AMPLIFIERS AND LINEAR ICs	CO1	Describe the characteristics of ideal and practical operational amplifier.
	CO2	Design filters and signal generators using linear ICs
	CO3	Demonstrate the application of Linear ICs as comparators and rectifiers
	CO4	Analyze voltage regulators for given specification using op-amp and IC voltage regulators

17EEL47 ELECTRICAL MACHINES LABORATORY - 2	CO1	Test DC machines to determine their characteristics and also to control the speed of DC motor
	CO2	Pre-determine the performance characteristics of DC machines by conducting suitable tests
	CO3	Perform load test on single phase and three phase induction motor to assess its performance
	CO4	Conduct test on induction motor to pre-determine the performance characteristics
	CO5	Conduct test on synchronous motor to draw the performance curves.

17EEL48 OP- AMP AND LINEAR ICS LABORATORY	CO1	To conduct experiment to determine the characteristic parameters of OP-Amp
	CO2	To design test the OP-Amp as Amplifier, adder, subtractor, differentiator and integrator
	CO3	To design test the OP-Amp as oscillators and filters.
	CO4	Design and study of Linear IC's as multivibrator power supplies.

V SEMESTER

17EE51 MANAGEMENT AND ENTREPRENEURSHIP	CO1	Explain the field of management, task of the manager, planning and steps in decision making.
	CO2	Discuss the structure of organization, importance of staffing, leadership styles, modes of communication, techniques of coordination and importance of managerial control in business.
	CO3	Explain the concepts of entrepreneurship and a businessman's social responsibilities towards different groups.
	CO4	Show an understanding of role of SSI's in the development of country and state/central level institutions/agencies supporting business enterprises
	CO5	Discuss the concepts of project management, capital budgeting, project feasibility studies, need for project report and new control techniques

17EE52 MICROCONTROLLER	CO1	Discuss the history of the 8051 and features of other 8051 family members and the internal architecture of the 8051.
	CO2	Discuss 8051 addressing modes, instruction set of 8051, accessing data and I/O port programming.
	CO3	Develop 8051C programs for time delay, I/O operations, I/O bit manipulation, logic and arithmetic operations, data conversion and timer/counter programming.
	CO4	Summarize the basics of serial communication and interrupts, also develop 8051 programs for serial data communication and interrupt programming.
	CO5	Discuss the hardware connection of the 8051 chip, its timers, serial data communication and its interfacing of 8051to the RS232.

17EE53 POWER ELECTRONICS	CO1	Explain application area of power electronics, types of power electronic circuits and switches their characteristics and specifications. Explain designing, analysis techniques and characteristics of thyristor controlled rectifiers
	CO2	. Explain types of power diodes, their characteristics, and the effects of power diodes on RL circuits
	CO3	Explain the techniques for design, operation and analysis of single phase diode rectifier circuits
	CO4	Explain steady state, switching characteristics and gate control requirements of different power transistors and their limitations.
	CO5	Discuss different types of Thyristors, their operation, gate characteristics and gate control requirements. Discuss the principle of operation of single phase and three phase DC - DC, DC –AC converters and AC voltage controllers

17EE54 SIGNALS AND SYSTEMS	CO1	Classify the signals and systems. Explain basic operations on signals and properties of systems. Apply discrete time Fourier transform representation to study signals and linear time invariant systems. Use Z-transform and properties of Z transform for the analysis of discrete time systems
	CO2	Use convolution in both continuous and discrete domain for the analysis of systems given the impulse response of a system.
	CO3	Evaluate response of a given linear time invariant system.
	CO4	Provide block diagram representation of a linear time invariant system
	CO5	Apply continuous time Fourier transform representation to study signals and linear time invariant systems.

17EE552 ELECTRICAL ENGINEERING MATERIALS Professional elective	CO1	Discuss electrical and electronics materials, their importance, classification and operational requirement
	CO2	Discuss conducting materials used in engineering, their properties and classification. Discuss dielectric materials used in engineering, their properties and classification. Discuss insulating materials used in engineering, their properties and classification
	CO3	Explain the phenomenon superconductivity, super conducting materials and their application in engineering.
	CO4	Explain the plastic and its properties and applications.
	CO5	Discuss materials used for Opto electronic devices

17EE563 RENEWABLE ENERGY RESOURCES Open elective	CO1	Discuss causes of energyscarcity and its solution, energy resources and availability of renewable Discus generation of energy from hydrogen, wind, geothermal system, solid waste and agriculturerefuse.
	CO2	Discuss energy from sun, energy reaching the Earth's surface and solar thermal energy applications.
	CO3	Discuss types of solar collectors, their configurations, solar cell system, its characteristics and their applications.
	CO4	Discuss production of energy from biomass, biogas.
	CO5	Discuss tidal energy resources, energy availability and power generation

17EEL57 MICROCONTROLLER LABORATORY	CO1	Write assembly language programs for data transfer, arithmetic, Boolean and logical instructions and code conversions.
	CO2	Write ALP using subroutines for generation of delays, counters, configuration of SFRs for serial communication and timers.
	CO3	Perform interfacing of stepper motor and dc motor for controlling the speed, elevator, LCD, external ADC and temperature control.
	CO4	Generate different waveforms using DAC interface
	CO5	Work a small team to carryout experiments using microcontroller concepts and prepare reports that present lab

		work

17EEL58 POWER ELECTRONICS LABORATORY	CO1	Obtain static characteristics of semiconductor devices to discuss their performance.
	CO2	Trigger the SCR by different methods
	CO3	Verify the performance of single phase controlled full wave rectifier and AC voltage controller with R and RL loads
	CO4	Control the speed of a DC motor, universal motor and stepper motors
	CO5	Verify the performance of single phase full bridge inverter connected to resistive load

VI SEMSTER

17EE61 CONTROL SYSTEMS	CO1	Discuss the effects of feedback and types of feedback control systems.
	CO2	Evaluate the transfer function of a linear time invariant system.
	CO3	Evaluate the stability of linear time invariant systems Apply block diagram manipulation and signal flow graph methods to obtain transfer function of systems.
	CO4	Demonstrate the knowledge of mathematical modeling of control systems and components
	CO5	Determine transient and steady state time response of a simple control system

17EE62 POWER SYSTEM ANALYSIS-– 1	CO1	Show understanding of per unit system, its advantages and computation.
	CO2	Show the concept of one line diagram and its implementation in problems
	CO3	Perform short circuit analysis on a synchronous machine and simple power system to select a circuit breaker for the system.
	CO4	Evaluate symmetrical components of voltages and currents in un-balanced three phase circuits.
	CO5	Analyze three phase synchronous machine and simple power systems for different unsymmetrical faults using symmetrical components

17EE63 DIGITAL SIGNAL PROCESSING	CO1	Compute the DFT of various signals using its properties and linear filtering of two sequences.
	CO2	Apply fast and efficient algorithms for computing DFT and inverse DFT of a given sequence. Design infinite impulse response Butterworth digital filters using impulse invariant / bilinear transformation technique
	CO3	Design infinite impulse response Chebyshev digital filters using impulse invariant or bilinear• transformation technique. Realize a digital IIR filter by direct, cascade, parallel and ladder methods of realization
	CO4	Discuss different window functions and frequency sampling method used for design of FIR filters
	CO5	Design FIR filters by use of window function or by frequency sampling method Realize a digital FIR filter by direct, cascade, and linear phase form.

17EE64 ELECTRICAL MACHINE DESIGN	CO1	Discuss design factors, limitations, modern trends in design, manufacturing of electrical machines and properties of materials used in the electrical machines.
	CO2	Derive the output equations of transformer, DC machines and AC machines
	CO3	Discuss selection of specific loadings and magnetic circuits of different electrical machines Design the field windings of DC machine and Synchronous machine
	CO4	Design stator and rotor circuits of a DC and AC machines.

17EE654 SOLAR AND WIND ENERGY Professional elective	CO1	Discuss the importance of energy in human life, relationship among economy and environment with energy use and the increasing role of renewable energy.
	CO2	Explain the concept of energy storage and the principles of energy storage devices
	CO3	To discuss solar radiation on horizontal and tilted surface, its characteristics, measurement and analysis of radiation data. Describe the process of harnessing solar energy and its applications in heating and cooling
	CO4	Discuss fabrication, operation of solar cell, electrical characteristics, sizing and design of solar PV systems and their applications
	CO5	Discuss the performance of Wind-machines, energy storage, applications of Wind Energy and environmental aspects
17EE662 SENSORS AND TRANSDUCERS(Open	CO1	Discuss need of transducers, their classification, advantages and disadvantages. Show an understanding of working of various transducers and sensors.
	CO2	Discuss recent trends in sensor technology and their selection

Elective)	CO3	Discuss basics of signal conditioning and signal conditioning equipment
	CO4	Discuss configuration of Data Acquisition System and data conversion
	CO5	Show an understanding of working of various transducers and sensors.

17EEL67 CONTROL SYSTEM LABORATORY	CO1	Utilize software package and discrete components in assessing the time and frequency domain response of a given second order system.
	CO2	Design, analyze and simulate Lead, Lag and Lag – Lead compensators for given specifications.
	CO3	Determine the performance characteristics of ac and DC servomotors and synchro-transmitter receiver pair used in control systems.
	CO4	Simulate the DC position and feedback control system to study the effect of P, PI, PD and PID controller and Lead compensator on the step response of the system
	CO5	Develop a script files to plot Root locus, Bode plot and Nyquist plot to study the stability

17EEL68 DIGITAL SIGNAL PROCESSING LABORATORY	CO1	Explain physical interpretation of sampling theorem in time and frequency domains.
	CO2	Evaluate the impulse response of a system
	CO3	Perform convolution of given sequences to evaluate the response of a system.
	CO4	Compute DFT and IDFT of a given sequence using the basic definition and/or fast methods
	CO5	Provide a solution for a given difference equation.Design and implement IIR and FIR filters.

VII SEMESTER

17EE71 POWER SYSTEM ANALYSIS – 2	CO1	Formulate network matrices and models for solving load flow problems.
	CO2	Perform steady state power flow analysis of power systems using numerical iterative techniques
	CO3	Discuss optimal scheduling for hydro-thermal system, power system security and reliability.
	CO4	Analyze short circuit faults in power system networks using bus impedance matrix
	CO5	Perform numerical solution of swing equation for multi-machine stability

17EE72 POWER SYSTEM PROTECTION	CO1	Discuss performance of protective relays, components of protection scheme and relay terminology over current protection.
	CO2	Explain the working of distance relays and the effects of arc resistance, power swings, line length and source impedance on performance of distance relays.
	CO3	Discuss pilot protection, construction, operating principles and performance ofdifferential relays and discuss protection of generators, motors, transformer and Bus Zone Protection.
	CO4	Explain the construction and operation of different types of circuit breakers
	CO5	Outline features of fuse, causes of overvoltages and its protection, also modern trends in Power System Protection.14

17EE73 HIGH VOLTAGE ENGINEERING	CO1	Explain conduction and breakdown phenomenon in gases, liquid dielectrics.
	CO2	Explain breakdown phenomenon in solid dielectrics
	CO3	Explain generation of high voltages and currents
	CO4	Discuss measurement techniques for high voltages and currents.
	CO5	Discuss overvoltage phenomenon and insulation coordination in electric power systems

17EE742 UTILIZATION OF ELECTRICAL POWER (PROFESSIONAL ELECTIVE)	CO1	Discuss different methods of electric heating & welding.
	CO2	Discuss the laws of electrolysis, extraction, refining of metals and electro deposition process.
	CO3	Discuss the laws of illumination, different types of lamps, lighting schemes and design of lighting systems.
	CO4	Explain the motors used for electric traction, their control & braking and power supply system used for electric traction.
	CO5	Analyze systems of electric traction, speed time curves and mechanics of train movement.

17EE744 POWER SYSTEM PLANNING	CO1	Discuss primary components of power system planning, planning methodology for optimum power system expansion, various types of generation, transmission and distribution
	CO2	. Show knowledge of forecasting of future load requirements of both demand and energy by deterministic and statistical techniques using forecasting tools.
	CO3	Understand economic appraisal to allocate the resources efficiently and appreciate the investment decisions
	CO4	Discuss methods to mobilize resources to meet the investment requirement for the power sector
	CO5	Discuss expansion of power generation and planning for system energy in the country, evaluation of operating states of transmission system, their associated contingencies and the stability of the system.

17EEL76 POWER SYSTEM SIMULATION LABORATORY	CO1	Develop a program in MATLAB to assess the performance of medium and long transmission lines. Develop a program in MATLAB to assess the transient stability under three phase fault at different locations in a of radial power systems.
	CO2	Develop a program in MATLAB to obtain the power angle characteristics of salient and non-salient pole alternator.
	CO3	Develop programs in MATLAB to formulate bus admittance and bus impedance matrices of interconnected power systems
	CO4	Use Mi-Power package to solve power flow problem for simple power systems
	CO5	Use Mi-Power package to study unsymmetrical faults at different locations in radial power systems

17EEL77 RELAY AND HIGH VOLTAGE LABORATORY	CO1	Experimentally verify the characteristics of over current, over voltage, under voltage and negative sequence relays both electromagnetic and static type
	CO2	Experimentally verify the characteristics of microprocessor based over current, over voltage, under voltage relays and distance relay.
	CO3	. Show knowledge of protecting generator, motor and feeders.
	CO4	Analyze the spark over characteristics for both uniform and non-uniform configurations using High AC and DC voltages.
	CO5	Measure high AC and DC voltages and breakdown strength of transformer oil.
17EEP78 PROJECT PHASE – I and Seminar	CO1	Demonstrate a sound technical knowledge of their selected project topic.
	CO2	• Undertake problem identification, formulation and solution
	CO3	Design engineering solutions to complex problems utilizing a systems approach
	CO4	Communicate with engineers and the community at large in written an oral forms.

VIII SEMESTER

17EE81 POWER SYSTEM OPERATION AND CONTROL	CO1	Describe various levels of controls in power systems, the vulnerability of the system, components, architecture and configuration of SCADA.
	CO2	Solve unit commitment problems
	CO3	Explain issues of hydrothermal scheduling and solutions to hydro thermal problems
	CO4	Explain basic generator control loops, functions of Automatic generation control, speed governors
	CO5	Develop and analyze mathematical models of Automatic Load Frequency Control

17EE82 INDUSTRIAL DRIVES AND APPLICATIONS	CO1	Explain the advantages and choice of electric drive
	CO2	Explain dynamics and different modes of operation of electric drives.
	CO3	Suggest a motor for a drive and control of dc motor using controlled rectifiers
	CO4	Analyze the performance of induction motor drives under different conditions
	CO5	Control induction motor, synchronous motor and stepper motor drives

17EE831 SMART GRID(Professional Elective)	CO1	Discuss the progress made by different stakeholders in the design and development of smart grid
	CO2	Explain measurement techniques using Phasor Measurement Units and smart meters
	CO3	Discuss tools for the analysis of smart grid and design, operation and performance
	CO4	Discuss classical optimization techniques and computational methods for smart grid design, planning and operation.
	CO5	Explain predictive grid management and control technology for enhancing the smart grid performance

17EE84 INTERNSHIP / PROFESSIONAL PRACTICE	CO1	Gain practical experience within industry in which the internship is done.
	CO2	Acquire knowledge of the industry in which the internship is done.
	CO3	Apply knowledge and skills learned to classroom work.
	CO4	Develop a greater understanding about career options while more clearly defining personal career goals
	CO5	Experience the activities and functions of professionals.

17EEP85 PROJECT	CO1	Present the project and be able to defend it.
	CO2	Make links across different areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills

WORK PHASE -II		to the project task.
	CO3	Communicate effectively and to present ideas clearly and coherently in both the written and oral forms.
	CO4	Work in a team to achieve common goal.
	CO5	Habituated to critical thinking and use problem solving skills

17EES86 SEMINAR	CO1	Attain, use and develop knowledge in the field of electrical and electronics engineering and other disciplines through independent learning and collaborative study.
	CO2	Identify, understand and discuss current, real-time issues
	CO3	Improve oral and written communication skills
	CO4	Explore an appreciation of the self in relation to its larger diverse social and academic contexts

Department of EEE

Course Outcomes(2018 Scheme)

I SEMESTER

18MAT11 Calculus and Linear Algebra	CO1	Apply the knowledge of calculus to solve problems relayed to polar curves and its application in determining the bentness of the curve
	CO2	Learn the notion of partial differentiation to calculate rates of change of multivariate functions and solve problems related to composite functions and Jacobians.
	CO3	: Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing the area and volumes.
	CO4	Solve first order linear/nonlinear differential equation analytically using standard methods
	CO5	Make use of matrix theory for solving system of linear equations and compute eigen values and eigenvectors required for matrix diagonalization process

18PHY12 ENGINEERING PHYSICS	CO1	Understand various types of oscillations and their implications, the role of Shock waves in various fields and Recognize the elastic properties of materials for engineering applications
	CO2	Realize the interrelation between time varying electric field and magnetic field, the transverse nature of the EM waves and their role in optical fiber communication.
	CO3	Compute Eigen values, Eigen functions, momentum of Atomic and subatomic particles using Time independent 1-D Schrodinger's wave equation
	CO4	Apprehend theoretical background of laser, construction and working of different types of laser and its applications in different fields
	CO5	Understand various electrical and thermal properties of materials like conductors, semiconductors and dielectrics using different theoretical models.

18ELE13 BASIC ELECTRICAL ENGINEERING	CO1	Analyse D.C and A.C circuits.
	CO2	Explain the principle of operation and construction of single phase transformers.
	CO3	Explain the principle of operation and construction of DC machines and synchronous machines
	CO4	Explain the principle of operation and construction of three phase induction motors
	CO5	Discuss concepts of electrical wiring, circuit protecting devices and earthing.

18CIV14	CO1	Mention the applications of various fields of Civil Engineering.

ELEMENTS OF CIVIL ENGINEERING AND MECHANICS	CO2	Compute the resultant of given force system subjected to various loads.
	CO3	Comprehend the action of Forces, Moments and other loads on systems of rigid bodies and compute the reactive forces that develop as a result of the external loads.
	CO4	Locate the Centroid and compute the Moment of Inertia of regular and built-up sections
	CO5	. Express the relationship between the motion of bodies and analyze the bodies in motion.

18EGDL15 ENGINEERING GRAPHICS	CO1	Prepare engineering drawings as per BIS conventions mentioned in the relevant codes.
	CO2	Produce computer generated drawings using CAD software.
	CO3	Use the knowledge of orthographic projections to represent engineering information / concepts and present the same in the form of drawings.
	CO4	Develop isometric drawings of simple objects reading the orthographic projections of those objects.
	CO5	Convert pictorial and isometric views of simple objects to orthographic views.

18PHYL16 Engg. Physics Lab	CO1	Apprehend the concepts of interference of light, diffraction of light, Fermi energy and magnetic effect of current
	CO2	Understand the principles of operations of optical fibers and semiconductor devices such as Photodiode, and NPN transistor using simple circuits
	CO3	Determine elastic moduli and moment of inertia of given materials with the help of suggested procedures
	CO4	Recognize the resonance concept and its practical applications
	CO5	Understand the importance of measurement procedure, honest recording and representing the data, reproduction of final results

18ELEL17	CO1	Identify the common electrical components and measuring instruments used for conducting experiments in electrical lab
	CO2	Compare power factor of lamps
	CO3	Determine impedance of an electrical circuit
	CO4	Determine Power consumed in a three phase load
	CO5	Determine earth resistance and understand 2 way and 3 way control of lamps.

18EGH18 Functional English for Engineers	CO1	Improve the functional effectiveness through better workplace communication skills
	CO2	Acquire basic proficiency in English reading and listening, comprehensions, writing and speaking skills
	CO3	Write campus recruitment exams, engineering competitive exams and all other general competitive exams

	CO4	Improve business and technical communication skills and technical writing skills

II SEMESTER

18MAT21 Advanced Calculus and Numerical Methods	CO1	Illustrate the applications of multivariate calculus to understand the solenoidal and irrotational vectors and also exhibit the inter dependence of line, surface and volume integrals.
	CO2	Demonstrate various physical models through higher order differential equations and solve such linear ordinary differential equations.
	CO3	Construct a variety of partial differential equations and solution by exact methods/method of separation of variables.
	CO4	Explain the applications of infinite series and obtain series solution of ordinary differential equations.
	CO5	Apply the knowledge of numerical methods in the modeling of various physical and engineering phenomena.

18CHE22 Engineering Chemistry	CO1	Use of free energy in equilibria, rationalize bulk properties and processes using thermodynamic considerations, electrochemical energy systems.
	CO2	Causes & effects of corrosion of metals and control of corrosion. Modification of surface properties of metals to develop resistance to corrosion, wear, tear, impact etc. by electroplating and electrolysis plating.
	CO3	Production & consumption of energy for industrialization of country and living standards of people. Electrochemical and concentration cells. Classical, modern batteries and fuel cells. Utilization of solar energy for different useful forms of energy.
	CO4	Environmental pollution, waste management and water chemistry.
	CO5	: Different techniques of instrumental methods of analysis. Fundamental principles of nano materials.

18CPS23 C PROGRAMMING FOR PROBLEM SOLVING	CO1	Illustrate simple algorithms from the different domains such as mathematics, physics, etc.
	CO2	Construct a programming solution to the given problem using C.
	CO3	Identify and correct the syntax and logical errors in C programs.
	CO4	Modularize the given problem using functions and structures.
18ELN24 BASIC ELECTRONICS	CO1	Describe the operation of diodes, BJT, FET and Operational Amplifiers. Design and explain the construction of rectifiers, regulators, amplifiers and oscillators.
	CO2	Describe general operating principles of SCRs and its application
	CO3	Explain the working and design of Fixed voltage IC regulator using 7805 and Astable oscillator using Timer IC 555.
	CO4	Explain the different number system and their conversions and construct simple combinational and sequential logic circuits using

		Flip-Flops
	CO5	Describe the basic principle of operation of communication system

18ME25 ELEMENTS OF MECHANICAL ENGINEERING	CO1	Identify different sources of energy and their conversion process.
	CO2	Explain the working principle of hydraulic turbines, pumps, IC engines and refrigeration.
	CO3	Recognize various metal joining processes and power transmission elements.
	CO4	Understand the properties of common engineering materials and their applications in engineering industry.
	CO5	Discuss the working of conventional machine tools, machining processes, tools and accessories. Describe the advanced manufacturing systems

18CHEL26 Engineering Chemistry Lab	CO1	Handling different types of instruments for analysis of materials using small quantities of materials involved for quick and accurate results.
	CO2	Carrying out different types of titrations for estimation of concerned in materials using comparatively more quantities of materials involved for good results

18CPL27 COMPUTER PROGRAMMING LABORATORY	CO1	Write algorithms, flowcharts and program for simple problems.
	CO2	Correct syntax and logical errors to execute a program.
	CO3	Write iterative and wherever possible recursive programs.
	CO4	Demonstrate use of functions, arrays, strings, structures and pointers in problem solving.

18EGH28 Technical Communication (English) - II	CO1	Acquire basic English grammar and essentials of language skills
	CO2	Get familiarized with English vocabulary and language proficiency.
	CO3	Improve the functional effectiveness through identifying common errors in spoken and written communication.
	CO4	Improve their Technical Communication Skills through Technical writing and Readind practices
	CO5	Write campus recruitment exams, engineering competitive exams and all other general competitive exams

III SEMESTER

18MAT31 TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES	CO1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering
	CO2	: Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.
	CO3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.
	CO4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.
	CO5	Determine the externals of functionals using calculus

18EE32 ELECTRIC CIRCUIT ANALYSIS	CO1	Understand the basic concepts, basic laws and methods of analysis of DC and AC networks and reduce the complexity of network using source shifting, source transformation and network reduction using transformations.
	CO2	Solve complex electric circuits using network theorems.
	CO3	Discuss resonance in series and parallel circuits and also the importance of initial conditions and their evaluation
	CO4	Synthesize typical waveforms using Laplace transformation.
	CO5	Solve unbalanced three phase systems and also evaluate the performance of two port networks.

18EE33 TRANSFORMERS AND GENERATORS	CO1	Understand the construction and operation of 1-phase, 3-Phase transformers and Autotransformer.
	CO2	Analyze the performance of transformers by polarity test, Sumpner's Test, phase conversion, 3-phase connection, and parallel operation.
	CO3	Understand the construction and working of AC and DC Generators.
	CO4	Analyze the performance of the AC Generators on infinite bus and parallel operation.
	CO5	Determine the regulation of AC Generator by Slip test, EMF, MMF, and ZPF Methods
18EE34 ANALOG ELECTRONIC CIRCUITS	CO1	Obtain the output characteristics of clipper and clamper circuits.
	CO2	Design and compare biasing circuits for transistor amplifiers & explain the transistor switching
	CO3	Explain the concept of feedback, its types and design of feedback

		circuits
	CO4	Design and analyze the power amplifier circuits and oscillators for different frequencies
	CO5	Design and analysis of FET and MOSFET amplifiers

18EE35 DIGITAL SYSTEM DESIGN	CO1	Develop simplified switching equation using Karnaugh Maps and QuineMcClusky techniques.
	CO2	Design Multiplexer, Encoder, Decoder, Adder, Subtractors and Comparator as digital combinational control circuits.
	CO3	Design flip flops, counters, shift registers as sequential control circuits
	CO4	Develop Mealy/Moore Models and state diagrams for the given clocked sequential circuits
	CO5	Explain the functioning of Read only and Read/Write Memories, Programmable ROM, EPROM and Flash memory

18EE36 ELECTRICAL AND ELECTRONIC MEASUREMENTS	CO1	Measure resistance, inductance and capacitance using bridges and determine earth resistance.
	CO2	Explain the working of various meters used for measurement of Power, Energy & understand the adjustments, calibration & errors in energy meters.
	CO3	Understand methods of extending the range of instruments & instrument transformers
	CO4	Explain the working of different electronic instruments.
	CO5	Explain the working of different display and recording devices.

18EEL37 ELECTRICAL MACHINES LABORATORY - 1	CO1	Evaluate the performance of transformers from the test data obtained.
	CO2	Connect and operate two single phase transformers of different KVA rating in parallel.
	CO3	Connect single phase transformers for three phase operation and phase conversion
	CO4	Compute the voltage regulation of synchronous generator using the test data obtained in the laboratory.
	CO5	Evaluate the performance of synchronous generators from the test data and assess the performance of synchronous generator connected to infinite bus
18EEL38 ELECTRONICS LABORATORY	CO1	Design and test rectifier circuits with and without capacitor filters.
	CO2	Determine h-parameter models of transistor for all modes.
	CO3	Design and test BJT and FET amplifier and oscillator circuits.
	CO4	Realize Boolean expressions, adders and subtractors using gates
	CO5	Design and test Ring counter/Johnson counter, Sequence generator and 3 bit counters.

18KVK39/49 Aadalitha	CO1	The student will be able to understand Kannada and communicate in Kannada language.

Kannada		
18KVK39/49 Vyavaharika Kannada	CO	The student will be able to understand Kannada and communicate in Kannada language.

18CPC39/49	CO1	Have constitutional knowledge and legal literacy.
	CO2	Understand Engineering and Professional ethics and responsibilities of Engineers
	CO3	Understand the cybercrimes and cyber laws for cyber safety measures

IV SEMESTER

18EE41 COMPLEX ANALYSIS, PROBABILITY AND STATISTICAL METHODS	CO1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
	CO2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
	CO3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
	CO4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
	CO5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis

18EE42 POWER GENERATION AND ECONOMICS	CO1	Describe the working of hydroelectric, steam, nuclear power plants and state functions of major equipment of the power plants.
	CO2	Classify various substations and explain the functions of major equipments in substations
	CO3	Explain the types of grounding and its importance.
	CO4	Infer the economic aspects of power system operation and its effects.
	CO5	Explain the importance of power factor improvement.

18EE43 TRANSMISSION AND DISTRIBUTION	CO1	Explain transmission and distribution scheme, identify the importance of different transmission systems and types of insulators.
	CO2	Analyze and compute the parameters of the transmission line for different configurations
	CO3	Assess the performance of overhead lines
	CO4	Interpret corona, explain the use of underground cables.
	CO5	Classify different types of distribution systems; examine its quality & reliability
18EE44 ELECTRIC MOTORS	CO1	Explain the construction, operation and classification of DC Motor, AC motor and Special purpose motors.
	CO2	Describe the performance characteristics & applications of Electric motors

	CO3	Demonstrate and explain the methods of testing of DC machines and determine losses and efficiency.
	CO4	Control the speed of DC motor and induction motor.
	CO5	Explain the starting methods, equivalent circuit and phasor diagrams, torque angle, effect of change in excitation and change in load, hunting and damping of synchronous motors.

18EE45 ELECTROMAGNETIC FIELD THEORY	CO1	Use different coordinate systems , Coulomb's Law and Gauss Law for the evaluation of electric fields produced by different charge configurations.
	CO2	Calculate the energy and potential due to a system of charges & Explain the behavior of electric field across a boundary conditions.
	CO3	Explain the Poisson's, Laplace equations and behavior of steady magnetic fields.
	CO4	Explain the behavior of magnetic fields and magnetic materials
	CO5	Asses time varying fields and propagation of waves in different media.

18EE46 OPERATIONAL AMPLIFIERS AND LINEAR ICs	CO1	Describe the characteristics of ideal and practical operational amplifier.
	CO2	Design filters and signal generators using linear ICs
	CO3	Demonstrate the application of Linear ICs as comparators and rectifiers
	CO4	Analyze voltage regulators for given specification using op-amp and IC voltage regulators
	CO5	Summarize the basics of PLL and Timer

18EEL47 ELECTRICAL MACHINES LABORATORY - 2	CO1	Test DC machines to determine their characteristics and also to control the speed of DC motor
	CO2	Pre-determine the performance characteristics of DC machines by conducting suitable tests
	CO3	Perform load test on single phase and three phase induction motor to assess its performance
	CO4	Conduct test on induction motor to pre-determine the performance characteristics
	CO5	Conduct test on synchronous motor to draw the performance curves.

18EEL48 OP- AMP AND LINEAR ICS	CO1	To conduct experiment to determine the characteristic parameters of OP-Amp
	CO2	To design test the OP-Amp as Amplifier, adder, subtractor, differentiator and integrator

LABORATORY	CO3	To design test the OP-Amp as oscillators and filters.
	CO4	Design and study of Linear IC's as multivibrator power supplies.

V SEMESTER

18EE51 MANAGEMENT AND ENTREPRENEURSHIP	CO1	Explain the field of management, task of the manager, planning and steps in decision making.
	CO2	Discuss the structure of organization, importance of staffing, leadership styles, modes of communication, techniques of coordination and importance of managerial control in business.
	CO3	Explain the concepts of entrepreneurship and a businessman's social responsibilities towards different groups.
	CO4	Show an understanding of role of SSI's in the development of country and state/central level institutions/agencies supporting business enterprises
	CO5	Discuss the concepts of project management, capital budgeting, project feasibility studies, need for project report and new control techniques

18EE52 MICROCONTROLLER	CO1	Outline the 8051 architecture, registers, internal memory organization, addressing modes.
	CO2	Discuss 8051 addressing modes, instruction set of 8051, accessing data and I/O port programming.
	CO3	Develop 8051C programs for time delay, I/O operations, I/O bit manipulation, logic and arithmetic operations, data conversion and timer/counter programming.
	CO4	Summarize the basics of serial communication and interrupts, also develop 8051 programs for serial data communication and interrupt programming.
	CO5	Program 8051 to work with external devices for ADC, DAC, Stepper motor control, DC motor control, Elevator control.

18EE53 POWER ELECTRONICS	CO1	To give an overview of applications power electronics, different types of power semiconductor devices, their switching characteristics, power diode characteristics, types, their operation and the effects of power diodes on RL circuits.
	CO2	To explain the techniques for design and analysis of single phase diode rectifier circuits.
	CO3	To explain different power transistors, their steady state and switching characteristics and limitations.
	CO4	To explain different types of Thyristors, their gate characteristics and gate control requirements.
	CO5	To explain the design, analysis techniques, performance parameters and characteristics of controlled rectifiers, DC- DC, DC -AC converters and Voltage controllers.

18EE54 SIGNALS AND SYSTEMS	CO1	Explain the generation of signals, behavior of system and the basic operations that can be performed on signals and properties of systems.
	CO2	Apply convolution in both continuous and discrete domain for the analysis of systems given impulse response of a system
	CO3	Solve the continuous time and discrete time systems by various methods and their representation by block diagram
	CO4	Perform Fourier analysis for continuous and discrete time, linear time invariant systems.
	CO5	Apply Z-transform and properties of Z transform for the analysis of discrete time systems.

18EE55 ELECTRICAL MACHINE DESIGN	CO1	Identify and list, limitations, modern trends in design, manufacturing of electrical machines and properties of materials used in the electrical machines.
	CO2	Derive the output equation of DC machine, discuss selection of specific loadings and magnetic circuits of DC machines, design the field windings of DC machine, and design stator and rotor circuits of a DC machine
	CO3	Derive the output equations of transformer, discuss selection of specific loadings, estimate the number of cooling tubes, no load current and leakage reactance of core type transformer.
	CO4	Develop the output equation of induction motor, discuss selection of specific loadings and magnetic circuits of induction motor, design stator and rotor circuits of a induction motor.
	CO5	Formulate the output equation of alternator, design the field windings of Synchronous machine, discuss short circuit ratio and its effects on performance of synchronous machines, design salient pole and non-salient pole alternators for given specifications

18EE56 HIGH VOLTAGE ENGINEERING	CO1	Explain conduction and breakdown phenomenon in gases, liquid dielectrics and breakdown phenomenon in solid dielectrics.
	CO2	Summarize generation of high voltages and currents
	CO3	Outline measurement techniques for high voltages and currents
	CO4	Summarize overvoltage phenomenon and insulation coordination in electric power systems.
	CO5	Explain non-destructive testing of materials and electric apparatus, high-voltage testing of electric apparatus

18EEL57 MICROCONTROLLER LABORATORY	CO1	Write assembly language programs for data transfer, arithmetic, Boolean and logical instructions and code conversions.
	CO2	Write ALP using subroutines for generation of delays, counters, configuration of SFRs for serial communication and timers.
	CO3	Perform interfacing of stepper motor and dc motor for

		controlling the speed, elevator, LCD, external ADC and temperature control.
	CO4	Generate different waveforms using DAC interface
	CO5	Work with a small team to carryout experiments using microcontroller concepts and prepare reports that present lab work

18EEL58 POWER ELECTRONICS LABORATORY	CO1	Obtain static characteristics of semiconductor devices to discuss their performance.
	CO2	Trigger the SCR by different methods
	CO3	Verify the performance of single phase controlled full wave rectifier and AC voltage controller with R and RL loads
	CO4	Control the speed of a DC motor, universal motor and stepper motors
	CO5	Verify the performance of single phase full bridge inverter connected to resistive load

VI SEMSTER

18EE61 CONTROL SYSTEMS	CO1	Analyze and model electrical and mechanical system using analogous.
	CO2	Formulate transfer functions using block diagram and signal flow graphs.
	CO3	Analyze the stability of control system, ability to determine transient and steady state time response.
	CO4	Illustrate the performance of a given system in time and frequency domains, stability analysis using Root locus and Bode plots.
	CO5	Discuss stability analysis using Nyquist plots, Design controller and compensator for a given specification.

18EE62 POWER SYSTEM ANALYSIS	CO1	Model the power system components & construct per unit impedance diagram of power system.
	CO2	Analyze three phase symmetrical faults on power system.
	CO3	Compute unbalanced phasors in terms of sequence components and vice versa, also develop sequence networks.

– 1	CO4	Analyze various unsymmetrical faults on power system.
	CO5	Examine dynamics of synchronous machine and determine the power system stability

18EE63 DIGITAL SIGNAL PROCESSING	CO1	Apply DFT and IDFT to perform linear filtering techniques on given sequences to determine the output.
	CO2	Apply fast and efficient algorithms for computing DFT and inverse DFT of a given sequence
	CO3	Design and realize infinite impulse response Butterworth and Chebyshev digital filters using impulse invariant and bilinear transformation techniques
	CO4	Develop a digital IIR filter by direct, cascade, parallel, ladder and FIR filter by direct, cascade and linear phase methods of realization.
	CO5	Design and realize FIR filters by use of window function and frequency sampling method.

18EE646 ELECTRIC VEHICLE TECHNOLOGIES (PROFESSIONAL ELECTIVE)	CO1	Explain the working of electric vehicles and recent trends.
	CO2	Analyze different power converter topology used for electric vehicle application.
	CO3	Design converters for battery charging and explain transformer less topology
	CO4	Develop the electric propulsion unit and its control for application of electric vehicles.

18EE653 RENEWABLE ENERGY RESOURCES (OPEN ELECTIVE)	CO1	Discuss causes of energy scarcity and its solution, energy resources and availability of renewable energy. Discuss production of energy from biomass, biogas.
	CO2	Outline energy from sun, energy reaching the Earth's surface and solar thermal energy applications.
	CO3	Discuss types of solar collectors, their configurations, solar cell system, its characteristics and their applications
	CO4	Explain generation of energy from hydrogen, wind, geothermal system, solid waste and agriculture refuse
	CO5	Summarize tidal energy resources, sea wave energy and ocean thermal energy

18EEL67 CONTROL SYSTEM LABORATORY	CO1	Utilize software package and discrete components in assessing the time and frequency domain response of a given second order system.
	CO2	Design, analyze and simulate Lead, Lag and Lag – Lead compensators for given specifications.
	CO3	Determine the performance characteristics of ac and DC servomotors and synchro-transmitter receiver pair used in control systems.

	CO4	Simulate the DC position and feedback control system to study the effect of P, PI, PD and PID controller and Lead compensator on the step response of the system
	CO5	Develop a script files to plot Root locus, Bode plot and Nyquist plot to study the stability

18EEL68 DIGITAL SIGNAL PROCESSING LABORATORY	CO1	Explain physical interpretation of sampling theorem in time and frequency domains.
	CO2	Evaluate the impulse response of a system
	CO3	Perform convolution of given sequences to evaluate the response of a system.
	CO4	Compute DFT and IDFT of a given sequence using the basic definition and/or fast methods
	CO5	Provide a solution for a given difference equation.Design and implement IIR and FIR filters.
18EEMP68 MINI PROJECT	CO1	Present the mini-project and be able to defend it. Make links across different areas of knowledge and to generate, develop and evaluate ideas and information to apply these skills to the project task.
	CO2	Habituated to critical thinking and use problem solving skillS
	CO3	Communicate effectively and to present ideas clearly and coherently in both the written and oral forms.
	CO4	Learn on their own, reflect on their learning and take appropriate actions to improve it
	CO5	Work in a team to achieve common goal
INTERNSHIP	CO1	To expand thinking and broaden the knowledge and skills acquired through course work in the field. To relate to, interact with, and learn from current professionals in the field.
	CO2	To gain a greater understanding of the duties and responsibilities of a professional. To understand and adhere to professional standards in the field.
	CO3	To gain insight to professional communication including meetings, memos, reading, writing, public speaking, research, client interaction, input of ideas, and confidentiality.
	CO4	To identify personal strengths and weaknesses
	CO5	To develop the initiative and motivation to be a self-starter and work independently.

VII SEMESTER

18EE71 POWER SYSTEM ANALYSIS – 2	CO1	Formulate network matrices and models for solving load flow problems.
	CO2	Perform steady state power flow analysis of power systems using numerical iterative techniques
	CO3	Solve issues of economic load dispatch and unit commitment problems.
	CO4	Analyze short circuit faults in power system networks using bus impedance matrix.
	CO5	Apply Point by Point method and Runge Kutta Method to solve Swing Equation

18EE72 POWER SYSTEM PROTECTION	CO1	Discuss performance of protective relays, components of protection scheme and relay terminology over current protection.
	CO2	Explain the working of distance relays and the effects of arc resistance, power swings, line length and source impedance on performance of distance relays.
	CO3	Discuss pilot protection, construction, operating principles and performance ofdifferential relays and discuss protection of generators, motors, transformer and Bus Zone Protection.
	CO4	Explain the construction and operation of different types of circuit breakers
	CO5	Outline features of fuse, causes of overvoltages and its protection, also modern trends in Power System Protection.14

18EE731 SOLAR AND WIND ENERGY (PROFESSIONAL ELECTIVE)	CO1	Discuss the importance of the role of renewable energy, the concept of energy storage and the principles of energy storage devices.
	CO2	Discuss the concept of solar radiation data and solar PV system fabrication, operation of solar cell, sizing and design of PV system.
	CO3	Describe the process of harnessing solar energy and its applications in heating and cooling
	CO4	Explain basic Principles of Wind Energy Conversion, collection of wind data, energy estimation and site selection.
	CO5	Discuss the performance of Wind-machines, energy storage, applications of Wind Energy and environmental aspects

18EE742	CO1	Discuss different methods of electric heating & welding.
	CO2	Discuss the laws of electrolysis, extraction, refining of metals and

UTILIZATION OF ELECTRICAL POWER (PROFESSIONAL ELECTIVE)		electro deposition process.
	CO3	Discuss the laws of illumination, different types of lamps, lighting schemes and design of lighting systems.
	CO4	Explain the motors used for electric traction, their control & braking and power supply system used for electric traction.
	CO5	Analyze systems of electric traction, speed time curves and mechanics of train movement.

18EE744 SMART GRID (PROFESSIONAL ELECTIVE)	CO1	Explain the concept of Smart grid enables the ElectricNet and need of smart grid.
	CO2	Outline the benefits and drivers of DC Power delivery system
	CO3	Summarize the Intelligrid Architecture for the smart grid
	CO4	Explain the Efficient Electric End-use Technology Alternatives
	CO5	Discuss Demand side planning and Evaluation

18EEL76 POWER SYSTEM SIMULATION LABORATORY	CO1	Develop a program in suitable package to assess the performance of medium and long transmission lines.
	CO2	Develop a program in suitable package to obtain the power angle characteristics of salient and non-salient pole alternator. Develop a program in suitable package to assess the transient stability under three phase fault at different locations in a of radial power systems
	CO3	Develop programs in suitable package to formulate bus admittance and bus impedance matrices of interconnected power systems. Use suitable package to solve power flow problem for simple power systems
	CO4	Use suitable package to study unsymmetrical faults at different locations in radial power systems
	CO5	Use of suitable package to study optimal generation scheduling problems for thermal power plants.

18EEL77 RELAY AND HIGH VOLTAGE LABORATORY	CO1	Verify the characteristics of over current, over voltage, under voltage and negative sequence relay both electromagnetic and static type.
	CO2	Verify the characteristics of microprocessor based over current, over voltage, under voltage relays and distance relay.
	CO3	Show knowledge of protecting generator, motor and feeders. • Analyze the spark over characteristics for both uniform and non-uniform configurations using High A and DC voltages. • Measure high AC and DC voltages and breakdown strength of transformer oil.
	CO4	Draw electric field and measure the capacitance of different electrode configuration models.
	CO5	Show knowledge of generating standard lightning impulse voltage to determine efficiency, energy of impulse generator and 50% probability flashover voltage for air insulation.
18EEP78 PROJECT	CO1	Demonstrate a sound technical knowledge of their selected project topic.

PHASE – I	CO2	• Undertake problem identification, formulation and solution
	CO3	Design engineering solutions to complex problems utilizing a systems approach
	CO4	Communicate with engineers and the community at large in written an oral forms.

18EE744 SMART GRID (PROFESSIONAL ELECTIVE)	CO1	Explain the concept of Smart grid enables the ElectricNet and need of smart grid.
	CO2	Outline the benefits and drivers of DC Power delivery system
	CO3	Summarize the Intelligrid Architecture for the smart grid
	CO4	Explain the Efficient Electric End-use Technology Alternatives
	CO5	Discuss Demand side planning and Evaluation

VIII SEMESTER

18EE81 POWER SYSTEM OPERATION AND CONTROL	CO1	Describe various levels of controls in power systems, architecture and configuration of SCADA.
	CO2	Develop and analyze mathematical models of Automatic Load Frequency Control.
	CO3	Develop mathematical model of Automatic Generation Control in Interconnected Power system
	CO4	Discuss the Control of Voltage , Reactive Power and Voltage collapse
	CO5	Explain security, contingency analysis, state estimation of power systems

18EE824 POWER SYSTEM PLANNING (PROFESSIONAL ELECTIVE)	CO1	Discuss primary components of power system planning, planning methodology for optimum power system expansion and load forecasting.
	CO2	Understand economic appraisal to allocate the resources efficiently and appreciate the investment decisions
	CO3	Discuss principles of distribution planning, supply rules, network development and the system studies
	CO4	Discuss reliability criteria for generation, transmission, distribution and reliability evaluation and analysis, grid reliability, voltage disturbances and their remedies Discuss planning and implementation of electric –utility activities, market principles and the norms framed
	CO5	Discuss expansion of power generation and planning for system energy in the country, evaluation of operating states of transmission system, their associated contingencies and the stability of the system

18EE83 PROJECT WORK PHASE -II	CO1	Present the project and be able to defend it. Make links across different areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task.
	CO2	Habituated to critical thinking and use problem solving skills
	CO3	Communicate effectively and to present ideas clearly and coherently in both the written and oral forms.
	CO4	Learn on their own, reflect on their learning and take appropriate actions to improve it
	CO5	Work in a team to achieve common goal

18EES84	CO1	Attain, use and develop knowledge in the field of engineering and other disciplines through independent learning and collaborative

TECHNICAL SEMINAR		study.
	CO2	Improve oral and written communication skills
	CO3	Explore an appreciation of the self in relation to its larger diverse social and academic contexts
	CO4	Apply principles of ethics and respect in interaction with other
	CO5	Identify, understand and discuss current, real-time issues

18EEI85 INTERNSHIP	CO1	Gain practical experience within industry in which the internship is done.
	CO2	Acquire knowledge of the industry in which the internship is done.
	CO3	Apply knowledge and skills learned to classroom work
	CO4	Develop a greater understanding about career options while more clearly defining personal career goals. Develop and refine oral and written communication skills.
	CO5	Experience the activities and functions of professionals.

SET POs (17 scheme)

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
I SEMESTER															
17MAT11	3	3	3	2	1	0	1	1	1.2	1	0	3			
17PHY12	2	1.6	0	1	1	1	0	0	0	0	0	1			
17CIV13	2.6	1.8	0	0	0	0	0	0	0	0	0	0			
17EME14	2	3	2	0	0	1.7	2	0	0	0	0	1.4			
17ELE15	2.7	1.3	1.2	1	0	0	0	0	0	0	0	1			
17EWSL16	2.4	1.3	1	0	0	1	1	0	0	1	1	1			
17PHYL17	2.3	1	1	0	1	1	1	1	0	0	0	1			
II SEMESTER															
17MAT21	3	3	3	2	1	0	1	1	1.2	1	0	3			
17CHE22	3	2.2	1.4	0	0	1	1.4	1	0	0	0	1			
17PCD23	1.8	2.3	2.2	0	0	0	0	0	0	0	0	0			
17CED24	1.5	1.5	1	1	1.5	0	0	0	2	1.5	0	1.3			
17ELN25	3	3	1.4	1.4	0	0	0	0	0	0	0	0			
17CPL26	3	2.7	2.8	0	1	0	0	0	1	0	0	2			
17CHEL27	1.5	1.5	0	0	1	0	1.5	1	1	1	0	1			
III SEMESTER															
17MAT31	3	3	3	2	1	0	1	0	1	1	0	3	2	2.2	2
17EE32	3	3	2.2	1.3	1.3	0	0	0	0	0	0	0	3	1.6	1
17EE33	2.5	2	2	2.3	0	1	1	0	0	0	0	3	1.7	3	1.2
17EE34	3	3	2	1	0	0	0	0	0	0	0	0	3	3	0
17EE35	3	2.7	2.2	2.2	0	0	0	0	0	0	0	0	2	2	0
17EE36	3	3	2.3	2.5	0	0	0	0	1	0	1	2	2.5	2.7	1
17EEL37	3	2	0	3	0	2	0	0	3	1	1	1	3	2	1
17EEL38	3	2	1.8	1	1.5	0	0	0	0	0	0	0	2.3	1.8	0
IV SEMESTER															
17MAT41	3	3	3	2	1	0	1	0	1	1	2	3	2	2.2	2
17EE42	3	2.7	2.8	1	1	0	0	0	0	0	0	0	3	2.7	2
17EE43	3	2.5	3	0	2	1.8	2	0	0	0	1	0	2.5	1.5	0
17EE44	2.7	2	1.7	0	0	0	0	0	0	0	0	0	2.5	1.3	0
17EE45	2.2	1.8	1.3	2	2	1	0	0	0	1	0	1.5	3	3	3
17EE46	2	1.88	2	1.88	1.65	0.7	0.7	0.71	0.7	1.45	0.71	1.17	2.11	1.3	0
17EEL47	3	2.2	2.5	2.4	2.3	0	0	2	1	1	0	2	1.7	2	1
17EEL48	3	2.67	2	2.67	2.5	0	0	0	0	0	0	0	3	2	0

V SEMESTER															
17EE51	1	1	1.2	0	1	1	0	2	3	1.5	1.8	0	0	1.3	1.5
17EE52	3	2.3	2.8	3	2.3	2	2	0	1.3	0	2	2	2	2.2	2.3
17EE53	3	3	2	1.6	2	0	0	0	0	0	0	0	3	2	0
17EE54	2.7	1.8	1.5	2.3	1.3	1.3	2	0	0	1	0	1	2.7	2	1
17EE551	2	1	1	0	0	0	0	0	0	0	0	0	2.2	1	0
17EE552	2.8	2	2	1	0	2	0	0	0	0	0	0	0	3	1
17EC562	1.5	1.5	1.3	1.8	1	0	0	0	0	0	0	1	1	1.3	1.3
17EE563	3	2	3	0	0	0	3	0	0	0	0	0	0	3	3
17EEL57	2	2.7	2.8	2	2	0	0	0	3	0	0	0	2	2.2	0
17EEL58	3	2.2	2.5	2.4	2.5	0	0	2	1	1	0	2	1.7	2	1
VI SEMESTER															
17EE61	3	2.7	2.2	2.2	0	0	0	0	0	0	0	0	2	0	0
17EE62	3	2.8	2.4	2.2	3	0	0	0	0	0	1	1	3	2.33	
17EE63	3	3	3	3	3	0	0	0	0	0	0	0	3	3	3
17EE64	1.8	1.8	2.3	1	1	0	0	0	0	0	0		2.3	2.3	1
17EE654	3	1.83	1	1	1	0	0	0	0	0	0	0	1	2.4	
17EE662	2.6	2	1.8	1	2	0	0	0	0	0	0	0	3	0	0
17CS664	1.2	1.5	1.3	1.8	1	0	0	0	0	0	0	1	1	1.3	1.3
17EEL67	3	3	3	3	3	1.3	0	0	3	2	2.7	1	3	2	2
17EEL68	2.6	2.2	2.4	2.2	2	1.5	0	0	2.4	1.6	2.5	1.3	1.6	2	2
VII SEMESTER															
17EE71	3	2.8	2.2	2.3	3	0	0	0	0	0	1	2.7	0	0	0
17EE72	3	1.8	1	0	0	0	0	0	0	0	0	0	1	1	
17EE73	3	3	2	2	0	0	0	0	0	0	0	0	2.5	2.6	2
17EE741	3	3	3	3	3	2	0	0	0	0	2	1	3	3	3
17EE742	3	2.7	2.7	2.5	2.5	1	1	0	0	0	0	1.7	2.5	2	0
17EE744	2.5	1.8	2.2	0	0	2.6	2.3	0	0	0	0	2	2.5	1.5	1.3
17EE751	3	3	2.2	2.3	2	1	0	0	1	0	1	1.2	2.5	2.7	1
17EE752	3	1	2.5	3	0	2	0	0	0	0	2	0	3	3	2
17EEL76	3	2	2	3	3	0	0	0	0	0	0	0	3	3	0
17EEL77	3	1.8	1.8	1.7	1.5	0	0	0	0	0	0	0	2.8	1.7	0
17EEP78	2.5	2.5	2.5	3	3	3	3	3	3	3	1	1	3	3	2
VIII SEMESTER															
17EE81	2.8	2.7	2.8	2.7	2.3	1	1	1	1	1	1	1.7	2.5	2	0
17EE82	3	3	2.5	2.5	2	2.5	2	0	0	0	0	2.8	2.5	2.7	1

17EE831	3	2.3	2.8	2	3	2	2.3	2	1.3	2	2	2.3	2	2.2	2.3
17EE84	2	2	0	0	0	0	0	0	1.7	1.7	0	1.7	0	1	0
17EEP85	2.5	2.5	2.5	3	3	3	3	3	3	3	1	1	3	3	2
17EES86	2	2	0	0	0	0	0	0	1.7	1.7	0	1.7	0	1	0

Department of EEE

Course Outcomes (2017 SCHEME)

I & II SEMESTER

17MAT11 Engineering Mathematics-I	CO1	Use partial derivatives to calculate rates of change of multivariate functions.
	CO2	Analyze position, velocity, and acceleration in two or three dimensions using the calculus of vector valued functions.
	CO3	Recognize and solve first-order ordinary differential equations, Newton's law of cooling
	CO4	Use matrices techniques for solving systems of linear equations in the different areas of Linear Algebra.

17MAT21 Engineering Mathematics-II	CO1	Evaluate double and triple integrals to find area, volume, mass and moment of inertia of plane and solid region. Use curl and divergence of a vector valued functions in various applications of electricity, magnetism and fluid flows.
	CO2	Solve differential equations of electrical circuits, forced oscillation of mass spring and elementary heat transfer
	CO3	solve partial differential equations fluid mechanics, electromagnetic theory and heat transfer
	CO4	Use Laplace transforms to determine general or complete solutions to linear ODE

17PHY12/17PHY22 ENGINEERING PHYSICS	CO1	Learn and understand more about basic principles and to develop problem solving skills and implementation in technology.
	CO2	Gain Knowledge about Modern physics and quantum mechanics will update the basic concepts to implement the skills
	CO3	Study of material properties and their applications is the prime role to understand and use in engineering applications and studies.
	CO4	Study Lasers and Optical fibers and its applications are to import knowledge and to develop skills and to use modern instruments in the engineering applications.
	CO5	Understand Crystal structure and applications are to boost the technical skills and its applications.

17CHE12/17CHE22 ENGINEERING CHEMISTRY	CO1	Electrochemical and concentration cells. Classical & modern batteries and fuel cells.
	CO2	Causes & effects of corrosion of metals and control of corrosion. Modification of surface properties of metals to develop resistance to corrosion, wear, tear, impact etc. by electroplating and electro less plating.
	CO3	Production & consumption of energy for industrialization of country and living standards of people. Utilization of solar energy for different useful forms of energy.
	CO4	Replacement of conventional materials by polymers for various applications.
	CO5	Boiler troubles; sewage treatment and desalination of sea water,
17CIV13/23 Elements of Civil Engineering and Mechanics	CO1	Mention the applications of various fields of Civil Engineering.
	CO2	Compute the resultant of given force system subjected to various loads.
	CO3	Comprehend the action of Forces, Moments and other loads on systems of rigid bodies and compute the reactive forces that develop as a result of the external loads.
	CO4	Locate the Centroid and compute the Moment of Inertia of regular and built-up sections
	CO5	. Express the relationship between the motion of bodies and analyze the bodies in motion.

17PCD13/23 Programming in C and Data Structures	CO1	Achieve Knowledge of design and development of C problem solving skills.
	CO2	Understand the basic principles of Programming in C language
	CO3	Design and develop modular programming skills.
	CO4	Effective utilization of memory using pointer technology

17PCD13/23 Computer Aided Engineering Drawing	CO1	Students will be able to demonstrate the usage of CAD software.
	CO2	Students will be able to visualize and draw Orthographic projections, Sections of solids and Isometric views of solids.
	CO3	Students are evaluated for their ability in applying various concepts to solve practical problems related to engineering drawing

17EME14/24 Elements of Mechanical Engineering	CO1	Various Energy sources, Boilers, Prime movers such as turbines and IC engines, refrigeration and air-conditioning system
	CO2	Metal removal process using Lathe, drilling, Milling Robotics and Automation

	CO3	Fair understanding of application and usage of various engineering materials.

17ELE15/25 Basic Electrical Engineering	CO1	To predict the behaviour of electrical and magnetic circuits.
	CO2	Practice Electrical Safety Rules & standards.
	CO3	Realize the requirement of transformers in transmission and distribution of electric power and other applications
	CO4	Select the type of generator / motor required for a particular application.

17ELN15/25 Basic Electronics	CO1	Appreciate the significance of electronics in different applications,
	CO2	Understand the applications of diode in rectifiers, filter circuits and wave shaping
	CO3	Apply the concept of diode in rectifiers, filters circuits
	CO4	Design simple circuits like amplifiers (inverting and non inverting), comparators, adders, integrator and differentiator using OPAMPS,
	Co5	Compile the different building blocks in digital electronics using logic gates and implement simple logic function using basic universal gates,

17PHYL17/27 Engg. Physics Lab	CO1	Develop skills to impart practical knowledge in real time solution
	CO2	Understand principle, concept, working and application of new technology and comparison of results with theoretical calculations
	CO3	Design new instruments with practical knowledge.
	CO4	Gain knowledge of new concept in the solution of practical oriented problems and to understand more deep knowledge about the solution to theoretical problems.
	CO5	Understand measurement technology, usage of new instruments and real time applications in engineering studies.

17CHEL17/27 Chemistry Lab	CO1	Handling different types of instruments for analysis of materials using small quantities of materials involved for quick and accurate results, and
	CO2	Carrying out different types of titrations for estimation of concerned in materials using comparatively more quantities of materials involved for good results

17WSL16/26 Workshop Practice	CO1	Gain knowledge of development of sheet metal models with an understanding of their applications
	CO2	Demonstrate and produce different types of fitting models.
	CO3	Perform soldering and welding of different sheet metal & welded joints
	CO4	Understand the Basics of Workshop practices

17CPL16/26 Computer Programming lab	CO1	Gaining Knowledge on various parts of a computer.
	CO2	Able to draw flowcharts and write algorithms
	CO3	Able design and development of C problem solving skills.
	CO4	Able design and develop modular programming skills.

17CIV18/17CIV28 Environmental studies	CO1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,
	CO2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment,
	CO3	Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components
	CO4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues

III SEMESTER

17MAT31 ENGINEERING MATHEMATICS –III	CO1	Know the use of periodic signals and Fourier series to analyze circuits and system communications.
	CO2	Explain the general linear system theory for continuous-time signals and digital signal processing using the Fourier Transform and z-transform.
	CO3	Apply Green's Theorem, Divergence Theorem and Stokes' theorem in various applications in the field of electro-magnetic and gravitational fields and fluid flow problems.
	CO4	Determine the externals of functional and solve the simple problems of the calculus
	CO5	Employ appropriate numerical methods to solve algebraic and transcendental equations

17EE32 ELECTRIC CIRCUIT ANALYSIS	CO1	Understand the basic concepts, basic laws and methods of analysis of DC and AC networks and reduce the complexity of network using source shifting, source transformation and network reduction using transformations.
	CO2	Solve complex electric circuits using network theorems.
	CO3	Discuss resonance in series and parallel circuits and also the importance of initial conditions and their evaluation
	CO4	Synthesize typical waveforms using Laplace transformation.
	CO5	Solve unbalanced three phase systems and also evaluate the performance of two port networks.

17EE33 TRANSFORMERS AND GENERATORS	CO1	Explain the construction and operation and performance of single phase and three phase transformers.
	CO2	Explain the use of auto transformer, tap changing and tertiary winding transformer and need of operating transformers in parallel.
	CO3	Explain the armature reaction and commutation and their effects in a DC generators
	CO4	Explain the construction, operation and performance of Synchronous machines.
17EE34 ANALOG ELECTRONIC CIRCUITS	CO1	Predict the output characteristics of clipper and clamper circuits.
	CO2	Design and compare biasing circuits for transistor amplifiers & explain the transistor switching
	CO3	Explain the concept of feedback, its types and design of feedback circuits
	CO4	Design and analyze the power amplifier circuits and oscillators for different frequencies
	CO5	Perform Design and analysis of FET and MOSFET amplifiers

17EE35 DIGITAL SYSTEM DESIGN	CO1	Simplify switching equations generated from truth tables. Design combinational logic circuits; adders, Subtractors and comparators
	CO2	Design synchronous sequential circuits; latches, flip-flops, binary counters and Mod – 6 counters.
	CO3	Design Mealy and Moore synchronous sequential circuit models
	CO4	Describe the structure of HDL module, operators,data types.
	CO5	Understand the concept of data-flow description.

17EE36 ELECTRICAL AND ELECTRONIC MEASUREMENTS	CO1	Measure resistance, inductance and capacitance using bridges and determine earth resistance.
	CO2	Explain the working of various meters used for measurement of Power, Energy & understand the adjustments, calibration & errors in energy meters.
	CO3	Understand methods of extending the range of instruments & instrument transformers
	CO4	Explain the working of different electronic instruments.
	CO5	Explain the working of different display and recording devices.

17EEL37 ELECTRICAL MACHINES LABORATORY - 1	CO1	Evaluate the performance of transformers from the test data obtained.
	CO2	Connect and operate two single phase transformers of different KVA rating in parallel.
	CO3	Connect single phase transformers for three phase operation and phase conversion
	CO4	Compute the voltage regulation of synchronous generator using the test data obtained in the laboratory.
	CO5	Evaluate the performance of synchronous generators from the test data and assess the performance of synchronous generator connected to infinite bus
17EEL38 ELECTRONICS LABORATORY	CO1	Design and test rectifier circuits with and without capacitor filters.
	CO2	Determine h-parameter models of transistor for all modes.
	CO3	Design and test BJT and FET amplifier and oscillator circuits.
	CO4	Realize Boolean expressions, adders and subtractors using gates

IV SEMESTER

17EE41 ENGINEERING MATHEMATICS –IV	CO1	Use appropriate single step and multi-step numerical methods to solve first and second order ordinary differential equations arising in flow data design problems
	CO2	Explain the idea of analyticity, potential fields residues and poles of complex potentials in field theory and electromagnetic theory.
	CO3	Employ Bessel's functions and Legendre's polynomials for tackling problems arising in continuum mechanics, hydrodynamics and heat conduction.
	CO4	. Describe random variables and probability distributions using rigorous statistical methods to analyze problems associated with optimization of digital circuits, information, coding theory and stability analysis of systems.
	CO5	Apply the knowledge of joint probability distributions and Markov chains in attempting engineering problems for feasible random event

17EE42 POWER GENERATION AND ECONOMICS	CO1	Describe the working of hydroelectric, steam, nuclear power plants and state functions of major equipment of the power plants.
	CO2	Classify various substations and explain the functions of major equipments in substations
	CO3	Explain the types of grounding and its importance.
	CO4	Infer the economic aspects of power system operation and its effects.
	CO5	Explain the importance of power factor improvement.

17EE43 TRANSMISSION AND DISTRIBUTION	CO1	Explain the concepts of various methods of generation of power.
	CO2	Explain the importance of HVAC, EHVAC, UHVAC and HVDC transmission
	CO3	Design and analyze overhead transmission system for a given voltage level
	CO4	Calculate the parameters of the transmission line for different configurations and assess the performance ofline
	CO5	Explain the use of underground cables and evaluate different types of distribution systems
17EE44 ELECTRIC MOTORS	CO1	Explain the constructional features of Motors and select a suitable drive for specific application.
	CO2	Analyze and assess the performance characteristics of DC motors by conducting suitable tests and control the speed by suitable method
	CO3	. Explain the constructional features of Three Phase and Single phase induction Motors and assess their performance.
	CO4	Control the speed of induction motor by a suitable method.
	CO5	Explain the operation of Synchronous motor and special motors

17EE45 ELECTROMAGNETIC FIELD THEORY	CO1	Use different coordinate systems , Coulomb's Law and Gauss Law for the evaluation of electric fields produced by different charge configurations.
	CO2	Calculate the energy and potential due to a system of charges & Explain the behavior of electric field across a boundary conditions.
	CO3	Explain the Poisson's, Laplace equations and behavior of steady magnetic fields.
	CO4	Explain the behavior of magnetic fields and magnetic materials
	CO5	Asses time varying fields and propagation of waves in different media.

17EE46 OPERATIONAL AMPLIFIERS AND LINEAR ICs	CO1	Describe the characteristics of ideal and practical operational amplifier.
	CO2	Design filters and signal generators using linear ICs
	CO3	Demonstrate the application of Linear ICs as comparators and rectifiers
	CO4	Analyze voltage regulators for given specification using op-amp and IC voltage regulators

17EEL47 ELECTRICAL MACHINES LABORATORY - 2	CO1	Test DC machines to determine their characteristics and also to control the speed of DC motor
	CO2	Pre-determine the performance characteristics of DC machines by conducting suitable tests
	CO3	Perform load test on single phase and three phase induction motor to assess its performance
	CO4	Conduct test on induction motor to pre-determine the performance characteristics
	CO5	Conduct test on synchronous motor to draw the performance curves.

17EEL48 OP- AMP AND LINEAR ICS LABORATORY	CO1	To conduct experiment to determine the characteristic parameters of OP-Amp
	CO2	To design test the OP-Amp as Amplifier, adder, subtractor, differentiator and integrator
	CO3	To design test the OP-Amp as oscillators and filters.
	CO4	Design and study of Linear IC's as multivibrator power supplies.

V SEMESTER

17EE51 MANAGEMENT AND ENTREPRENEURSHIP	CO1	Explain the field of management, task of the manager, planning and steps in decision making.
	CO2	Discuss the structure of organization, importance of staffing, leadership styles, modes of communication, techniques of coordination and importance of managerial control in business.
	CO3	Explain the concepts of entrepreneurship and a businessman's social responsibilities towards different groups.
	CO4	Show an understanding of role of SSI's in the development of country and state/central level institutions/agencies supporting business enterprises
	CO5	Discuss the concepts of project management, capital budgeting, project feasibility studies, need for project report and new control techniques

17EE52 MICROCONTROLLER	CO1	Discuss the history of the 8051 and features of other 8051 family members and the internal architecture of the 8051.
	CO2	Discuss 8051 addressing modes, instruction set of 8051, accessing data and I/O port programming.
	CO3	Develop 8051C programs for time delay, I/O operations, I/O bit manipulation, logic and arithmetic operations, data conversion and timer/counter programming.
	CO4	Summarize the basics of serial communication and interrupts, also develop 8051 programs for serial data communication and interrupt programming.
	CO5	Discuss the hardware connection of the 8051 chip, its timers, serial data communication and its interfacing of 8051to the RS232.

17EE53 POWER ELECTRONICS	CO1	Explain application area of power electronics, types of power electronic circuits and switches their characteristics and specifications. Explain designing, analysis techniques and characteristics of thyristor controlled rectifiers
	CO2	. Explain types of power diodes, their characteristics, and the effects of power diodes on RL circuits
	CO3	Explain the techniques for design, operation and analysis of single phase diode rectifier circuits
	CO4	Explain steady state, switching characteristics and gate control requirements of different power transistors and their limitations.
	CO5	Discuss different types of Thyristors, their operation, gate characteristics and gate control requirements. Discuss the principle of operation of single phase and three phase DC - DC, DC –AC converters and AC voltage controllers

17EE54 SIGNALS AND SYSTEMS	CO1	Classify the signals and systems. Explain basic operations on signals and properties of systems. Apply discrete time Fourier transform representation to study signals and linear time invariant systems. Use Z-transform and properties of Z transform for the analysis of discrete time systems
	CO2	Use convolution in both continuous and discrete domain for the analysis of systems given the impulse response of a system.
	CO3	Evaluate response of a given linear time invariant system.
	CO4	Provide block diagram representation of a linear time invariant system
	CO5	Apply continuous time Fourier transform representation to study signals and linear time invariant systems.

17EE552 ELECTRICAL ENGINEERING MATERIALS Professional elective	CO1	Discuss electrical and electronics materials, their importance, classification and operational requirement
	CO2	Discuss conducting materials used in engineering, their properties and classification. Discuss dielectric materials used in engineering, their properties and classification. Discuss insulating materials used in engineering, their properties and classification
	CO3	Explain the phenomenon superconductivity, super conducting materials and their application in engineering.
	CO4	Explain the plastic and its properties and applications.
	CO5	Discuss materials used for Opto electronic devices

17EE563 RENEWABLE ENERGY RESOURCES Open elective	CO1	Discuss causes of energyscarcity and its solution, energy resources and availability of renewable Discus generation of energy from hydrogen, wind, geothermal system, solid waste and agriculturerefuse.
	CO2	Discuss energy from sun, energy reaching the Earth's surface and solar thermal energy applications.
	CO3	Discuss types of solar collectors, their configurations, solar cell system, its characteristics and their applications.
	CO4	Discuss production of energy from biomass, biogas.
	CO5	Discuss tidal energy resources, energy availability and power generation

17EEL57 MICROCONTROLLER LABORATORY	CO1	Write assembly language programs for data transfer, arithmetic, Boolean and logical instructions and code conversions.
	CO2	Write ALP using subroutines for generation of delays, counters, configuration of SFRs for serial communication and timers.
	CO3	Perform interfacing of stepper motor and dc motor for controlling the speed, elevator, LCD, external ADC and temperature control.
	CO4	Generate different waveforms using DAC interface
	CO5	Work a small team to carryout experiments using microcontroller concepts and prepare reports that present lab

		work

17EEL58 POWER ELECTRONICS LABORATORY	CO1	Obtain static characteristics of semiconductor devices to discuss their performance.
	CO2	Trigger the SCR by different methods
	CO3	Verify the performance of single phase controlled full wave rectifier and AC voltage controller with R and RL loads
	CO4	Control the speed of a DC motor, universal motor and stepper motors
	CO5	Verify the performance of single phase full bridge inverter connected to resistive load

VI SEMSTER

17EE61 CONTROL SYSTEMS	CO1	Discuss the effects of feedback and types of feedback control systems.
	CO2	Evaluate the transfer function of a linear time invariant system.
	CO3	Evaluate the stability of linear time invariant systems Apply block diagram manipulation and signal flow graph methods to obtain transfer function of systems.
	CO4	Demonstrate the knowledge of mathematical modeling of control systems and components
	CO5	Determine transient and steady state time response of a simple control system

17EE62 POWER SYSTEM ANALYSIS-– 1	CO1	Show understanding of per unit system, its advantages and computation.
	CO2	Show the concept of one line diagram and its implementation in problems
	CO3	Perform short circuit analysis on a synchronous machine and simple power system to select a circuit breaker for the system.
	CO4	Evaluate symmetrical components of voltages and currents in un-balanced three phase circuits.
	CO5	Analyze three phase synchronous machine and simple power systems for different unsymmetrical faults using symmetrical components

17EE63 DIGITAL SIGNAL PROCESSING	CO1	Compute the DFT of various signals using its properties and linear filtering of two sequences.
	CO2	Apply fast and efficient algorithms for computing DFT and inverse DFT of a given sequence. Design infinite impulse response Butterworth digital filters using impulse invariant / bilinear transformation technique
	CO3	Design infinite impulse response Chebyshev digital filters using impulse invariant or bilinear• transformation technique. Realize a digital IIR filter by direct, cascade, parallel and ladder methods of realization
	CO4	Discuss different window functions and frequency sampling method used for design of FIR filters
	CO5	Design FIR filters by use of window function or by frequency sampling method Realize a digital FIR filter by direct, cascade, and linear phase form.

17EE64 ELECTRICAL MACHINE DESIGN	CO1	Discuss design factors, limitations, modern trends in design, manufacturing of electrical machines and properties of materials used in the electrical machines.
	CO2	Derive the output equations of transformer, DC machines and AC machines
	CO3	Discuss selection of specific loadings and magnetic circuits of different electrical machines Design the field windings of DC machine and Synchronous machine
	CO4	Design stator and rotor circuits of a DC and AC machines.

17EE654 SOLAR AND WIND ENERGY Professional elective	CO1	Discuss the importance of energy in human life, relationship among economy and environment with energy use and the increasing role of renewable energy.
	CO2	Explain the concept of energy storage and the principles of energy storage devices
	CO3	To discuss solar radiation on horizontal and tilted surface, its characteristics, measurement and analysis of radiation data. Describe the process of harnessing solar energy and its applications in heating and cooling
	CO4	Discuss fabrication, operation of solar cell, electrical characteristics, sizing and design of solar PV systems and their applications
	CO5	Discuss the performance of Wind-machines, energy storage, applications of Wind Energy and environmental aspects
17EE662 SENSORS AND TRANSDUCERS(Open	CO1	Discuss need of transducers, their classification, advantages and disadvantages. Show an understanding of working of various transducers and sensors.
	CO2	Discuss recent trends in sensor technology and their selection

Elective)	CO3	Discuss basics of signal conditioning and signal conditioning equipment
	CO4	Discuss configuration of Data Acquisition System and data conversion
	CO5	Show an understanding of working of various transducers and sensors.

17EEL67 CONTROL SYSTEM LABORATORY	CO1	Utilize software package and discrete components in assessing the time and frequency domain response of a given second order system.
	CO2	Design, analyze and simulate Lead, Lag and Lag – Lead compensators for given specifications.
	CO3	Determine the performance characteristics of ac and DC servomotors and synchro-transmitter receiver pair used in control systems.
	CO4	Simulate the DC position and feedback control system to study the effect of P, PI, PD and PID controller and Lead compensator on the step response of the system
	CO5	Develop a script files to plot Root locus, Bode plot and Nyquist plot to study the stability

17EEL68 DIGITAL SIGNAL PROCESSING LABORATORY	CO1	Explain physical interpretation of sampling theorem in time and frequency domains.
	CO2	Evaluate the impulse response of a system
	CO3	Perform convolution of given sequences to evaluate the response of a system.
	CO4	Compute DFT and IDFT of a given sequence using the basic definition and/or fast methods
	CO5	Provide a solution for a given difference equation.Design and implement IIR and FIR filters.

VII SEMESTER

17EE71 POWER SYSTEM ANALYSIS – 2	CO1	Formulate network matrices and models for solving load flow problems.
	CO2	Perform steady state power flow analysis of power systems using numerical iterative techniques
	CO3	Discuss optimal scheduling for hydro-thermal system, power system security and reliability.
	CO4	Analyze short circuit faults in power system networks using bus impedance matrix
	CO5	Perform numerical solution of swing equation for multi-machine stability

17EE72 POWER SYSTEM PROTECTION	CO1	Discuss performance of protective relays, components of protection scheme and relay terminology over current protection.
	CO2	Explain the working of distance relays and the effects of arc resistance, power swings, line length and source impedance on performance of distance relays.
	CO3	Discuss pilot protection, construction, operating principles and performance ofdifferential relays and discuss protection of generators, motors, transformer and Bus Zone Protection.
	CO4	Explain the construction and operation of different types of circuit breakers
	CO5	Outline features of fuse, causes of overvoltages and its protection, also modern trends in Power System Protection.14

17EE73 HIGH VOLTAGE ENGINEERING	CO1	Explain conduction and breakdown phenomenon in gases, liquid dielectrics.
	CO2	Explain breakdown phenomenon in solid dielectrics
	CO3	Explain generation of high voltages and currents
	CO4	Discuss measurement techniques for high voltages and currents.
	CO5	Discuss overvoltage phenomenon and insulation coordination in electric power systems

17EE742 UTILIZATION OF ELECTRICAL POWER (PROFESSIONAL ELECTIVE)	CO1	Discuss different methods of electric heating & welding.
	CO2	Discuss the laws of electrolysis, extraction, refining of metals and electro deposition process.
	CO3	Discuss the laws of illumination, different types of lamps, lighting schemes and design of lighting systems.
	CO4	Explain the motors used for electric traction, their control & braking and power supply system used for electric traction.
	CO5	Analyze systems of electric traction, speed time curves and mechanics of train movement.

17EE744 POWER SYSTEM PLANNING	CO1	Discuss primary components of power system planning, planning methodology for optimum power system expansion, various types of generation, transmission and distribution
	CO2	. Show knowledge of forecasting of future load requirements of both demand and energy by deterministic and statistical techniques using forecasting tools.
	CO3	Understand economic appraisal to allocate the resources efficiently and appreciate the investment decisions
	CO4	Discuss methods to mobilize resources to meet the investment requirement for the power sector
	CO5	Discuss expansion of power generation and planning for system energy in the country, evaluation of operating states of transmission system, their associated contingencies and the stability of the system.

17EEL76 POWER SYSTEM SIMULATION LABORATORY	CO1	Develop a program in MATLAB to assess the performance of medium and long transmission lines. Develop a program in MATLAB to assess the transient stability under three phase fault at different locations in a of radial power systems.
	CO2	Develop a program in MATLAB to obtain the power angle characteristics of salient and non-salient pole alternator.
	CO3	Develop programs in MATLAB to formulate bus admittance and bus impedance matrices of interconnected power systems
	CO4	Use Mi-Power package to solve power flow problem for simple power systems
	CO5	Use Mi-Power package to study unsymmetrical faults at different locations in radial power systems

17EEL77 RELAY AND HIGH VOLTAGE LABORATORY	CO1	Experimentally verify the characteristics of over current, over voltage, under voltage and negative sequence relays both electromagnetic and static type
	CO2	Experimentally verify the characteristics of microprocessor based over current, over voltage, under voltage relays and distance relay.
	CO3	. Show knowledge of protecting generator, motor and feeders.
	CO4	Analyze the spark over characteristics for both uniform and non-uniform configurations using High AC and DC voltages.
	CO5	Measure high AC and DC voltages and breakdown strength of transformer oil.
17EEP78 PROJECT PHASE – I and Seminar	CO1	Demonstrate a sound technical knowledge of their selected project topic.
	CO2	• Undertake problem identification, formulation and solution
	CO3	Design engineering solutions to complex problems utilizing a systems approach
	CO4	Communicate with engineers and the community at large in written an oral forms.

VIII SEMESTER

17EE81 POWER SYSTEM OPERATION AND CONTROL	CO1	Describe various levels of controls in power systems, the vulnerability of the system, components, architecture and configuration of SCADA.
	CO2	Solve unit commitment problems
	CO3	Explain issues of hydrothermal scheduling and solutions to hydro thermal problems
	CO4	Explain basic generator control loops, functions of Automatic generation control, speed governors
	CO5	Develop and analyze mathematical models of Automatic Load Frequency Control

17EE82 INDUSTRIAL DRIVES AND APPLICATIONS	CO1	Explain the advantages and choice of electric drive
	CO2	Explain dynamics and different modes of operation of electric drives.
	CO3	Suggest a motor for a drive and control of dc motor using controlled rectifiers
	CO4	Analyze the performance of induction motor drives under different conditions
	CO5	Control induction motor, synchronous motor and stepper motor drives

17EE831 SMART GRID(Professional Elective)	CO1	Discuss the progress made by different stakeholders in the design and development of smart grid
	CO2	Explain measurement techniques using Phasor Measurement Units and smart meters
	CO3	Discuss tools for the analysis of smart grid and design, operation and performance
	CO4	Discuss classical optimization techniques and computational methods for smart grid design, planning and operation.
	CO5	Explain predictive grid management and control technology for enhancing the smart grid performance

17EE84 INTERNSHIP / PROFESSIONAL PRACTICE	CO1	Gain practical experience within industry in which the internship is done.
	CO2	Acquire knowledge of the industry in which the internship is done.
	CO3	Apply knowledge and skills learned to classroom work.
	CO4	Develop a greater understanding about career options while more clearly defining personal career goals
	CO5	Experience the activities and functions of professionals.

17EEP85 PROJECT	CO1	Present the project and be able to defend it.
	CO2	Make links across different areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills

WORK PHASE -II		to the project task.
	CO3	Communicate effectively and to present ideas clearly and coherently in both the written and oral forms.
	CO4	Work in a team to achieve common goal.
	CO5	Habituated to critical thinking and use problem solving skills

17EES86 SEMINAR	CO1	Attain, use and develop knowledge in the field of electrical and electronics engineering and other disciplines through independent learning and collaborative study.
	CO2	Identify, understand and discuss current, real-time issues
	CO3	Improve oral and written communication skills
	CO4	Explore an appreciation of the self in relation to its larger diverse social and academic contexts

CO-PO MAPPING 2018 SCHEME

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
I SEMESTER															
18MAT11	3	3	3	2	1	0	1	1	1.2	1	0	3			
18PHY12	2	1.6	0	1	1	1	0	0	0	0	0	1			
18ELE13	2.6	1.8	0	0	0	0	0	0	0	0	0	0			
18CIV14	2	3	2	0	0	1.7	2	0	0	0	0	1.4			
18EGDL15	2.7	1.3	1.2	1	0	0	0	0	0	0	0	1			
18PHYL16	2.4	1.3	1	0	0	1	1	0	0	1	1	1			
18ELEL17	2.3	1	1	0	1	1	1	1	0	0	0	1			
II SEMESTER															
18MAT21	3	3	3	2	1	0	1	1	1.2	1	0	3			
18CHE22	3	2.2	1.4	0	0	1	1.4	1	0	0	0	1			
18CPS23	1.8	2.3	2.2	0	0	0	0	0	0	0	0	0			
18ELN24	1.5	1.5	1	1	1.5	0	0	0	2	1.5	0	1.3			
18ME25	3	3	1.4	1.4	0	0	0	0	0	0	0	0			
18CHEL26	3	2.7	2.8	0	1	0	0	0	1	0	0	2			
18CPL27	1.5	1.5	0	0	1	0	1.5	1	1	1	0	1			
III SEMESTER															
18MAT31	3	3	3	2	1	0	1	0	1	1	0	3	2	2.2	2
18EE32	3	3	2.2	1.3	1.3	0	0	0	0	0	0	0	3	1.6	1
18EE33	2.5	2	2	2.3	0	1	1	0	0	0	0	3	1.7	3	1.2
18EE34	3	3	2	1	0	0	0	0	0	0	0	0	3	3	0
18EE35	3	2.7	2.2	2.2	0	0	0	0	0	0	0	0	2	2	0
18EE36	3	3	2.3	2.5	0	0	0	0	1	0	1	2	2.5	2.7	1
18EEL37	3	2	0	3	0	2	0	0	3	1	1	1	3	2	1
18EEL38	3	2	1.8	1	1.5	0	0	0	0	0	0	0	2.3	1.8	0
IV SEMESTER															
18MAT41	3	3	3	2	1	0	1	0	1	1	2	3	2	2.2	2
18EE42	3	2.7	2.8	1	1	0	0	0	0	0	0	0	3	2.7	2
18EE43	3	2.5	3	0	2	1.8	2	0	0	0	1	0	2.5	1.5	0
18EE44	2.7	2	1.7	0	0	0	0	0	0	0	0	0	2.5	1.3	0
18EE45	2.2	1.8	1.3	2	2	1	0	0	0	1	0	1.5	3	3	3
18EE46	2	1.88	2	1.88	1.65	0.7	0.7	0.71	0.7	1.45	0.71	1.17	2.11	1.3	0
18EEL47	3	2.2	2.5	2.4	2.3	0	0	2	1	1	0	2	1.7	2	1
18EEL48	3	2.67	2	2.67	2.5	0	0	0	0	0	0	0	3	2	0
V SEMESTER															
18EE51	1	1	1.2	0	1	1	0	2	3	1.5	1.8	0	0	1.3	1.5
18EE52	3	2.3	2.8	3	2.3	2	2	0	1.3	0	2	2	2	2.2	2.3
18EE53	3	3	2	1.6	2	0	0	0	0	0	0	0	3	2	0
18EE54	2.7	1.8	1.5	2.3	1.3	1.3	2	0	0	1	0	1	2.7	2	1
18EE55	1.8	1.8	2.3	1	1	0	0	0	0	0	0		2.3	2.3	1
18EE56	3	3	2	2	0	0	0	0	0	0	0	0	2.5	2.6	2
18EEL57	2	2.7	2.8	2	2	0	0	0	3	0	0	0	2	2.2	0
18EEL58	3	2.2	2.5	2.4	2.5	0	0	2	1	1	0	2	1.7	2	1
VI SEMESTER															
18EE61	1	2.5	2.3	2	2	2.5	2.3	1	0	2	0	2	1	2.7	
18EE62	3	2.8	2.4	2.2	3	0	0	0	0	0	1	1	3	2.33	
18EE63	3	3	3	3	3	0	0	0	0	0	0	0	3	3	3
18EE646	3	3	2	2	3	0	0	0	0	0	1	1	2	3	2
18EE653	3	2	3	0	0	0	3	0	0	0	0	0	0	3	3
18EEL67	3	3	3	3	3	1.3	0	0	3	2	2.7	1	3	2	2
18EEL68	2.6	2.2	2.4	2.2	2	1.5	0	0	2.4	1.6	2.5	1.3	1.6	2	2
VII SEMESTER															
18EE71	3	2.8	2	2.3	3	0	0	0	0	0	1	0	2.5	2.7	0
18EE72	3	1.8	1	0	0	0	0	0	0	0	0	0	1	1	
18EE731	3	3	2.4	2.4	0	0	0	0	1	0	1	2	2.4	2.6	1
18EE742	3	2.7	2.7	2.5	2.5	1	1	0	0	0	0	1.7	2.5	2	0
18EE744	3	2.3	2.8	2	3	2	2.3	2	1.3	2	2	2.3	2	2.2	2.3
18EEL76	3	2	2	3	3	0	0	0	0	0	0	0	3	3	0
18EEL77	3	1.8	1.8	1.7	1.5	0	0	0	0	0	0	0	2.8	1.7	0
18EEP78	2.5	2.5	2.5	3	3	3	3	3	3	3	1	1	3	3	2
VIII SEMESTER															
18EE81	2.8	2.7	2.8	2.7	2.3	1	1	1	1	1	1	1.7	2.5	2	0
18EE824	2.5	1.8	2.2	0	0	2.6	2.3	0	0	0	0	2	2.5	1.5	1.3
18EEP83	2.5	2.5	2.5	3	3	3	3	3	3	3	1	1	3	3	2
18EES84	2	2	0	0	0	0	0	0	1.7	1.7	0	1.7	0	1	0
18EEI85	2.5	2.5	2.5	3	3	3	3	3	3	3	1	1	3	3	2

Department of EIE

Staff: MADHURA G (Batch: 2016 - 2020)

C No	SUBJECT CODE	SUBJECT NAME
303	15EI33	ANALOG ELECTRONIC CIRCUITS

Course outcomes of ANALOG ELECTRONIC CIRCUITS (15EI33)

Course Name: C303	Year: 2016-20
	At the end of the course, the students are able to
C303.1	Apply the engineering knowledge to design and develop amplifier circuits using BJTs and FETs and analyse hybrid models for various biasing circuits
C303.2	Demonstrate the modelling of BJT/FET, perform small signal ac analysis and design BJT/FET amplifier networks.
C303.3	Examine the frequency response and to discuss the effects of circuit capacitances and parasitic capacitances on the response of single stage and multistage BJT/FET amplifiers
C303.4	Design, describe the operation and compare the power efficiency of various classes of Power amplifier circuits.
C303.5	Discuss the types of Feedback and their effects on Amplifier and Oscillator circuits.

Course Name: C303											**Year of study: 2018-2019**				
Course Outcomes	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**	**PSO3**
C303.1	3	3	3	1					1		2	2	3	3	2
C303.2	3	3	3	1					1		2	2	3	3	2
C303.3	3	3	3	1					1		2	2	3	3	2
C303.4	3	3	3	1					1		2	2	3	3	2
C303.5	3	3	3	1					1		2	2	3	3	2
C303	**3**	**3**	**3**	**1**					**1**		**2**	**2**	**3**	**3**	**2**

COs Mapping	POs Mapping	Level	Justification
CO1	PO1	2	Acquire the knowledge on different methods of measurement, instruments and understand the basic concepts of transducers and its applications.
	PO2	2	Discuss the basic concepts to identify the input output configuration of an instruments and measurement systems
	PO12	3	Instruments and measurement systems undergo wide technology changes. Extensive knowledge of the basic instruments and measurement systems will make the student adaptable to the technological changes.
	PSO1	2	Able to Identify functional characteristics of various Instruments and formulate and development of solution approach for to varied measurement systems and models.
	PSO2	3	Ability to identify procedures and components in relevant field will help to describe working principles of different Instruments.
	PSO3	3	Implement the basics of measurement systems and instruments in higher learning
CO2	PO1	3	Acquire the knowledge of static and dynamic characteristics of an Instrument.
	PO2	2	Analyses of time domain and frequency domain response for different type of inputs.
	PO3	2	Design solutions to complex problems using knowledge of time domain analysis and frequency domain analysis
	PO12	2	Recognize the response of different type of input applied to first order systems in time domain and frequency domain.

	PSO1	3	Knowledge of static and Dynamic characteristics of an Instrument and also Factors influencing the choice of transducers/instruments.
	PSO2	2	Different performance characteristics has to be analysed and utilized for varying parameters
	PSO3	3	Implement the basics of performance characteristics of an instruments in higher learning and latest technologies.
CO3	**PO1**	**3**	Acquire the knowledge of various sensors used for measurement of Displacement.
	PO2	**1**	Analyse the design and working principles of Displacement and Level sensors to adopting to the latest measurement systems.
	PO12	**2**	Apply the knowledge in designing the sensors for specific applications.
	PSO1	**3**	Knowledge of sensors is needed for effective solutions in the field of Instrument and Measurement systems.
	PSO2	**2**	To design and develop a displacement and level sensors for specific applications.
	PSO3	**3**	Demonstrated the functionality of sensing various parameters and adaptability to different process variables like displacement ,level etc.
CO4	**PO1**	**2**	Knowledge of fundamental key elements and concepts in understanding the working principle of different types of strain gauges.
	PO2	**2**	Analyse and compute the principal stress and principal strain for a given state of stress or strain.
	PO3	**3**	Develop solutions for stress, strain and force subjected to internal and external pressure and rotating discs.
	PO12	**2**	Recognize the need for in independent and life-long learning
	PSO1	**3**	To acquire knowledge of different instruments used for measuring stress, force and torque. To understand as to in which situation the concerned instrument has to be used.
	PSO2	**2**	Different performance characteristics has to be analysed and utilized for measurement of force.
	PSO3	**3**	Improved resistance wire strain-gauges are adaptable for various applications.
CO5	**PO1**	**3**	Fundamental knowledge of science is required for understanding the properties of various pressure sensors.
	PO2	**2**	Mathematical analysis and design of a various pressure sensor like Force balance pressure Transducer.
	PO3	**3**	Able to understand the various energies involved in a fluid flow problem and applying the Bernoulli's equation to find the total energy.
	PO12	**3**	Ability to access the technological changes that takes place in the sensors and ability to make use of it in different applications.

	PSO1	**3**	Analysis of different parameters is required to identify the procedures pertaining to various applications
	PSO2	**2**	Different performance characteristics has to be analysed and utilized for measurement of pressure.
	PSO3	**3**	The students will be able to build a strong foundation in Instrumentation for developing innovative products to meet the societal needs thereby evolving as an eminent entrepreneur.

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
304	15EI34	DIGITAL DESIGN AND HDL

Staff: Mrs. Sneha G Chachadi

Course outcomes of Digital Design and HDL (15EI34)

1. Simplify Boolean functions using K-map and Quine-McCluskey minimization technique
2. Analyze and design and combinational logic circuits. (MUX, De-MUX, adder and subtractor, and comparator circuits)
3. Analyze and design code converters, encoders and decoders.
4. Analyze and design of synchronous sequential circuits
5. Analyze and design sequential circuits, Moore/Mealy machines
6. Simulate and synthesize Verilog code in various styles

CO-PO mapping (Correlation Mapping)

Course Name: C304												Year: 2015-19			
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PSO 3
C304.1	3	3	3									1	2		
C304.2	3	3	3										2	1	1
C304.3	3	3	2									1	2	2	1
C304.4	3	3	3									1	2	1	1
C304.5	3	3	3		1							1	1	2	
C304.6	3	3	3		1							2	1	2	2
C304 (Avg.)	3	3	2.8	0	1	0	0	0	0	0	0	1.2	1.7	1.6	1.25

Transducers and Instrumentation – 15EI35

At the end of the course student will be able to-

CO PO Mapping	
CO1	Identify and use the suitable transducer for the specific application of measurement.
CO2	Apply suitable noise removal technique in the design of measuring instruments.
CO3	Interpret and analyse the static and dynamic characteristics of instruments.
CO4	Apply functional aspects and use transducers for displacement and strain measurement.
CO5	Explain functional aspects, usage of different transducers for temperature, level, pressure, speed, thickness measurement.

Total Outcome															
COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	2	2								3	3	1	3
CO2	2	3	1	2								3	3	1	3
CO3	2	3	2	2								3	3	1	2
CO4	2	3	1	2								3	3	1	2
CO5	2	3	1	1								3	3	1	3
CO - PO LEVEL	**2.0**	**3.0**	**1.4**	**1.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**3.0**	**3.0**	**1.0**	**2.6**

B. E. Electronics and Instrumentation Engineering

Semester III

Digital Design and HDL Lab(15EIL38)

Course Name:C308	**Year:2019-20**
	At the end of the course, the students are able to
C308.1	Realize Boolean expression using Universal gates / basic gates using ICs and Verilog
C308.2	Demonstrate the function of adder/subtractor circuits using gates/ICs & Verilog.
C308.3	Design and analyze the Comparator, Multiplexers Decoders, Encoders circuits using ICs and Verilog.
C308.4	Design and analysis of different Flip-flops and counters using gates and FFs
C308.5	Able to use FPGA/CPLD kits for down loading Verilog codes for shift registers and counters and check output.

Course Name: C308											**Year of study: 2019-20**				
Course Outcomes	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**	**PSO3**

C308.1	3	3	2	1	2							2	2	2	2
C308.2	3	3	2	1	2							3	2	2	3
C308.3	3	2	3	2	2							3	2	2	1
C308.4	3	3	3	2	2							3	1	2	2
C308.5	3	2	2	3	3							3	1	1	2
C308	3	2.6	2.4	1.8	2.2							2.8	1.6	1.8	2.0

COs Mapping	POs Mapping	Level	Justification
CO1	PO1		
	PO2		

	PO12		
	PSO1		
	PSO2		
	PSO3		
CO2	**PO1**		
	PO2		
	PO3		
	PO12		
	PSO1		
	PSO2		
	PSO3		
CO3	**PO1**		
	PO2		
	PO12		
	PSO1		
	PSO2		
	PSO3		
CO4	**PO1**		
	PO2		
	PO3		
	PO12		

	PSO1		
	PSO2		
	PSO3		
CO5	**PO1**		
	PO2		
	PO3		
	PO12		
	PSO1		
	PSO2		
	PSO3		

Department of EIE

Staff: Dr. MADHURA G (Batch: 2016 - 2020)

C No	SUBJECT CODE	SUBJECT NAME
403	15EI43	EMBEDDED CONTROLLERS

Course outcomes of EMBEDDED CONTROLLERS (15EI43)

Course Name: C403	Year: 2016-20
	At the end of the course, the students are able to
C403.1	Depict the organization, architecture, memory organization and interfacing of the 8051 and MSP430 microcontroller. Distinguish between different architectures of microcontrollers.
C403.2	Employ the knowledge of Addressing modes and Instruction set of 8051 and MSP430 Microcontroller to develop basic Assembly Language and C Programs.
C403.3	Review the features of timers, serial communication ports in 8051 microcontroller
C403.4	Illustrate how different peripherals are interfaced to the 8051 microcontroller and develop C programs for interfacing.
C403.5	Write 8051 and MSP430 Assembly language and C programs to generate timings and waveforms, to send and receive data

Course Name: C403												**Year of study: 2018-2019**			
Course Outcomes	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**	**PSO3**
C403.1	3	3	1	1				2				3	2	3	3
C403.2	3	3	3	3	2			**2**				3	2	3	3
C403.3	3	3	3	3	2			2				3	2	3	3
C403.4	3	3	3	3	3			2				3	2	3	3
C403.5	3	3	3	3	3			2				3	2	3	3
C303	**3**	**3**	**2.6**	**2.6**	**2**			**2**				**3**	**2**	**3**	**3**

COs Mapping	POs Mapping	Level	Justification
CO1	PO1	2	Acquire the knowledge on different methods of measurement, instruments and understand the basic concepts of transducers and its applications.
	PO2	2	Discuss the basic concepts to identify the input output configuration of an instruments and measurement systems
	PO12	3	Instruments and measurement systems undergo wide technology changes. Extensive knowledge of the basic instruments and measurement systems will make the student adaptable to the technological changes.
	PSO1	2	Able to Identify functional characteristics of various Instruments and formulate and development of solution approach for to varied measurement systems and models.
	PSO2	3	Ability to identify procedures and components in relevant field will help to describe working principles of different Instruments.
	PSO3	3	Implement the basics of measurement systems and instruments in higher learning
CO2	PO1	3	Acquire the knowledge of static and dynamic characteristics of an Instrument.
	PO2	2	Analyses of time domain and frequency domain response for different type of inputs.
	PO3	2	Design solutions to complex problems using knowledge of time domain analysis and frequency domain analysis
	PO12	2	Recognize the response of different type of input applied to first order systems in time domain and frequency domain.

	PSO1	3	Knowledge of static and Dynamic characteristics of an Instrument and also Factors influencing the choice of transducers/instruments.
	PSO2	2	Different performance characteristics has to be analysed and utilized for varying parameters
	PSO3	3	Implement the basics of performance characteristics of an instruments in higher learning and latest technologies.
CO3	**PO1**	**3**	Acquire the knowledge of various sensors used for measurement of Displacement.
	PO2	**1**	Analyse the design and working principles of Displacement and Level sensors to adopting to the latest measurement systems.
	PO12	**2**	Apply the knowledge in designing the sensors for specific applications.
	PSO1	**3**	Knowledge of sensors is needed for effective solutions in the field of Instrument and Measurement systems.
	PSO2	**2**	To design and develop a displacement and level sensors for specific applications.
	PSO3	**3**	Demonstrated the functionality of sensing various parameters and adaptability to different process variables like displacement ,level etc.
CO4	**PO1**	**2**	Knowledge of fundamental key elements and concepts in understanding the working principle of different types of strain gauges.
	PO2	**2**	Analyse and compute the principal stress and principal strain for a given state of stress or strain.
	PO3	**3**	Develop solutions for stress, strain and force subjected to internal and external pressure and rotating discs.
	PO12	**2**	Recognize the need for in independent and life-long learning
	PSO1	**3**	To acquire knowledge of different instruments used for measuring stress, force and torque. To understand as to in which situation the concerned instrument has to be used.
	PSO2	**2**	Different performance characteristics has to be analysed and utilized for measurement of force.
	PSO3	**3**	Improved resistance wire strain-gauges are adaptable for various applications.
CO5	**PO1**	**3**	Fundamental knowledge of science is required for understanding the properties of various pressure sensors.
	PO2	**2**	Mathematical analysis and design of a various pressure sensor like Force balance pressure Transducer.
	PO3	**3**	Able to understand the various energies involved in a fluid flow problem and applying the Bernoulli's equation to find the total energy.
	PO12	**3**	Ability to access the technological changes that takes place in the sensors and ability to make use of it in different applications.

	PSO1	**3**	Analysis of different parameters is required to identify the procedures pertaining to various applications
	PSO2	**2**	Different performance characteristics has to be analysed and utilized for measurement of pressure.
	PSO3	**3**	The students will be able to build a strong foundation in Instrumentation for developing innovative products to meet the societal needs thereby evolving as an eminent entrepreneur.

Control Systems (15EI44)

Course Name: C404												Year of study: 2019-20			
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C404.1	3	3	3	2								2	3	3	3
C404.2	3	2	3	2								2	3	3	3
C404.3	3	3	3	2								1	2	3	3
C404.4	3	2	3	2								2	2	2	3
C404.5	3	3	3	1								1	1	1	1
C404 avg	3.0	2.6	3.0	1.8								1.6	2.2	2.4	2.6

CO-PO Correlation Mapping Justification

Subject with Code: Control Systems (15EI44)

COs-POs / PSOs Mapping		Level	Justification
CO1	PO1	3	physical system modeling and analysis requires fundamental mathematical equations, operations and laws of science
	PO2	3	physical system modeling requires analysis and synthesis, transformation, transfer function
	PO3	3	System modeling is applied diversified fields

	PO4	**2**	System modeling theoretical aspects discussed but simulation and practical implementation required
	PO12	**2**	With the basic classical control system. Advanced high level applications can be understood, example non-linear system analysis.
	PSO1	**3**	Modeling of physical systems, Transfer function application of laws of physics demands basic domain knowledge.
	PSO2	**3**	Modeling of physical systems, transfer function, breaking the complexity into simplified equations requires application of skills acquired
	PSO3	**3**	With knowledge imparted during the course period help them to adapt to various advanced engineering fields where they can contribute to organization
CO2	**PO1**	**3**	Analysis of complex interconnected block transfer functions, and reduction, synthesis.
	PO2	**2**	Very basic principles of mathematics and analysis is involved in block diagram reduction and signal flow graph.
	PO3	**3**	Design of process/ plant requires simplification of subprocess to reduce the order of the system , if required even to remove the redundant systems, Block diagram reduction and signal flow graph is helpful
	PO4	**2**	Only synthesis is considered which is their by reducing the complexity of interconnected blocks/subprocess.
	PO12	**2**	With the basic classical control system. Advanced high-level applications can be understood, example non-linear system analysis.
	PSO1	**3**	Knowledge of a process, fundamental of mathematics and laws of physics is used to obtain optimized system and modules.
	PSO2	**3**	Design and development of controller of regulating the process variable to reference value requires eliminating the delay involved and to obtain optimized model.
	PSO3	**3**	Basic knowledge imparted can be utilized to migrate to various fields of engineering.
CO3	**PO1**	**3**	Mathematical representations of all type of signals and system transfer function, the response of the systems.
	PO2	**3**	Analysing and evaluating the system response in time and frequency diamine with reference standard inputs
	PO3	**3**	Analyse the performance of the designed systems

	PO4	**2**	Designing physically realizable system that can be employed in engineering applications
	PO12	**1**	Imparting the engineering design knowledge such that they can excel in developing products, and can engage themselves in learning.
	PSO1	**2**	Basic concepts of control systems, modeling, system response, Stability, MIMO system implementation discussed with problems and solution.
	PSO2	**3**	Deriving system transfer function for complex systems and performance evaluation in terms of stability.
	PSO3	**3**	Classical control system design and development enables learner to migrate and apply the concepts in interdisciplinary technologies to provide improvised solutions.
CO4	**PO1**	**3**	Stability analysis requires mathematical skills and laws of physics to apply in design
	PO2	**2**	Identify the inputs and outputs for the system and analysing the system such that one can formulate and apply strategies to provide improvised solutions
	PO3	**3**	Finding solution to by reducing redundancy in the system, generating model for the physical system, testing system with different types of the system and assessing stability
	PO4	**2**	To control any system measurement and maintaining the interested dynamic variable of a process is essential, course involves design and interpreting the response of the system, keeping view of stability
	PO12	**2**	Basics concepts related to how to design and control the system such that it works effectively well, related knowledge is imparted which can be effectively applied in understanding advances aspects of control system independently example in MIMO system
	PSO1	**2**	Mathematical and laws of physics are applied in modeling, design and development of the system and evaluating the performance
	PSO2	**2**	System performance and its stability analysis through design is carried out.
	PSO3	**3**	Classical control system design and development enables learner to migrate and apply the concepts in interdisciplinary technologies to provide improvised solutions.
CO5	**PO1**	3	Required basics of physics and mathematical aspects to provide solutions for the MIMO systems to know stability aspects and modeling of complex systems
	PO2	3	Identifying the inputs and formulating the methods in reducing the complexity of the problem related to state space analysis.

	PO3	3	Choosing of the minimal set of state variables and reducing the complexity of the network to provide improvised solutions.
	PO4	1	Theoretical aspects related to providing solutions to problems, and applying the same to solve the problems exercised but practical hands-on to be carried out.
	PO12	1	Basics concepts related in finding solutions to MIMO systems discussed and solved problems, however advanced aspects related to state space analysis in designing of the systems and to evaluate its performance is restricted. (will be covered in advanced control systems)
	PSO1	1	Only basic mathematical aspects and choosing of state variables in finding solutions to problems exercised but advanced aspects of controllability, observability and stability and methods related is taught in advanced control systems.
	PSO2	**1**	Basics skills related to identifying the inputs ,outputs state variables and solving problems for the given mechanical system, network is analysed.
	PSO3	**1**	Only basic knowledge about finding solutions to linear systems, however nonlinear systems analysis required.

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
406	15EI46	**Scientific and Analytical Instrumentation**

Staff: Mrs. Sneha G Chachadi

At the end of the course, the students are able to

1. Get well versed with the principle, construction and working and analysis of various analytical and scientific instrumentation.
2. Impart various spectroscopic techniques and its instrumentation in various fields like medicine, Industry, etc.
3. Impart and acquire knowledge on various chromatographic methods to separate the components of any mixture.
4. Impart methods of Industrial analyzers and its application.
5. Impart knowledge on various air pollutants, their sources and their effect on nature and Human

CO-PO mapping (Correlation Mapping)

Course Name: C304														**Year: 2015-19**
COURSE OUTCOMES	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**	**PSO3**
C406.1	3	3	3							2	1			1	
C406.2	**3**	2	2							2	**3**			1	
C406.3	3	3	3						1	2	2	1	1	2	
C406.4	3	1	1						1	2	1		2	1	
C406.5	3	3	2						2	1	**2**	**1**	1		
C406 (Avg.)	**3.0**	**2.4**	**2.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1.3**	**1.8**	**1.8**	**1.0**	**1.33**	**1.25**	**0.0**

==

Course Information Sheet

Faculty **Dr. Madhura G , Dr. Mallikarjun H M**

Email madhurag@ rnsit.ac.in mallikarjun.h.m@rnsit.ac.in

Contact Number 9620555266, 9743207651

Contact Time 3 hrs/week

Class Room Embedded Controllers Lab

Program: Electronics & Instrumentation Engineering	**Degree:** B.E
Course: Embedded Controllers Lab	**Semester:** III
Course Code: 15EIL47	**Regulation / Scheme:** 2015
No. of Lecture Hours / Week: 03 **Total No. of Lecture Hours :** 42	**IA Marks:** 20 **Exam Marks:** 80
	Exam Hours: 03

Course outcomes of Embedded Controllers Lab (15EIL37)

Course Name: C407	
	At the end of the course, the students are able to
C407.1	Design and debug programs in 8051 and MSP430 based advanced software tools
C407.2	Enhance programming skills in assembly and C
C407.3	Design and interfacing of microcontroller based embedded systems
C407.4	Build Projects for instrumentation, automation and control applications

CO-PO mapping (Correlation Mapping)

Course Name: C407/ Embedded Controllers Lab (15EIL47)															
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C407.1	1	1	2	3	2						1	2	1	2	1
C407.2	2	2	3	2	2							2	1	1	1
C407.3	2	3	2	2	2			2				2	1	1	1
C407.4	2	2	2	3	2			2			1	2	1	2	1
C407 (Avg.)	**1.8**	**2.0**	**2.3**	**2.3**	**2.0**	**0.0**	**0.0**	**1.0**	**0.0**	**0.0**	**1.0**	**2.0**	**1.0**	**1.5**	**1.0**

Process Control Systems (15EI53)

Course Name: C503												Year of study: 2019-20			
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C503.1	3	3	2									3	3	2	2
C503.2	3	3	3									2	3	3	3
C503.3	3	3	3									3	2	3	2
C503.4	3	3	3									3	3	3	2
C503.5	3	2	2									1	2	2	1
C503 avg	3.0	2.8	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	2.6	2.6	2.0

CO-PO Correlation Mapping and Justification

Subject with Code: Process Control Systems (18EI53)

COs-POs / PSOs Mapping		Level	Justification
CO1	PO1	3	Laws of physics and mathematical representation of the devices and transfer functions, engineering fundamentals in understanding process and its characteristic's.
	PO2	3	Analysing the closed loop process control systems and assess the performance, using different techniques.
	PO3	2	Designing basic closed loop control systems to provide control of the interested dynamic variable for the given specifications, however design strategies for complex systems not covered in this course outcome.

	PO12	**3**	Basics of the process behaviour and control systems enables to apply in learning advanced applications and complex sub systems and systems.
	PSO1	**3**	Knowledge related to fundamentals related to elements of the process and its behaviour with respect to regulating dynamic variable, including DDC and networking of process is dealt.
	PSO2	**2**	Design and development of process control systems requires understanding the underlaying aspects of the process is exercised, Advanced aspects of control is taught in this course outcome.
	PSO3	**2**	An overview of the process and its characteristics, present control strategies taught which enable to apply knowledge in other engineering fields.
CO2	**PO1**	**3**	Mathematical relationship input and output of the controllers (Discontinuous controller modes: Two position, multiposition, floating control modes. Continuous controller modes: Proportional (P), Integral (I), Derivative (D) control modes, Composite controller modes: PI, PD, PID modes)
	PO2	**3**	Conceptual understanding of the controllers, response of the controllers with respect to input and outputs, behaviour of the controllers with dynamic errors.
	PO3	**3**	Design of controllers and conceptual understanding along with mathematical equations helps in design and development of the controllers.
	PO12	**2**	Concepts of controllers helps in understanding complex designs.
	PSO1	**3**	Basic knowledge about process, inputs, expected output related mathematical equations.
	PSO2	**3**	Skillset related to designing and development and response of controllers imparted.
	PSO3	**3**	The imparted knowledge about controllers to control different industrial process helps to migrate and adapt to changing technologies.
CO3	**PO1**	**3**	Mathematical aspects and laws of physics applied in understanding process I/O characteristic's and design of analog and digital controllers.
	PO2	**3**	Identify process variables and choosing controlling variable to control the controlled variable.
	PO3	**3**	The complete strategies to design analog and digital controllers for the given specifications.
	PO12	**3**	Knowledge imparted in design and development of the controllers such that its made useful in learning advanced aspects.

	PSO1	**2**	fundamental concepts related to design of controllers for regulating process physical variables.
	PSO2	**3**	Complete design and development of automatic control system for the given specifications in the in both analog and digital domain.
	PSO3	**2**	Knowledge imparted enables to analyse and apply control strategies, but predictive techniques with analysing statistical parameters to be considered.
CO4	**PO1**	**3**	laws of physics w.r.t dynamic variables of a process. Apply the mathematical formulae, empirical formulas related to loop tuning and asses the quality of regulation.
	PO2	**3**	Analyse the process and its dynamic variables in obtaining the solution to regulate the process controlled variables.
	PO3	**3**	Developing solutions to self-regulating and non-self-regulating process and assess the quality of control systems.
	PO12	**3**	Knowledge imparted in obtaining solutions to regulate industrial process enable to apply in advanced control systems.
	PSO1	**3**	Knowledge imparted and the exercise related in finding solution to regulate the dynamic variable of a process.
	PSO2	**3**	Skills related to loop tuning and analyse the quality by using measures and techniques.
	PSO3	**2**	Techniques in developing solutions to bring regulation in industrial process, one can apply in diversified fields of engineering, Predictive techniques is the state-of-art
CO5	**PO1**	3	Mathematical modeling of the process systems and simulation aspects and advanced control strategies discussed.
	PO2	2	Though mathematical aspects and algorithms related to system modeling and simulation an overview is given detail discussion on algorithms AI/ML is the requirement.
	PO3	2	In depth analysis and simulation by applying statistically related aspects related to control the variables of a process is required.
	PO12	1	Only a brief overview of all the advanced control techniques/ strategies discussed.
	PSO1	2	The particular course outcome only confined to knowing modeling and simulation aspects with handful of examples.

	PSO2	**2**	Basics skills in developing the control strategies as applied to considering statistical parameters is imparted.
	PSO3	**1**	Basic fundamentals related to predictive analysis and control of process dynamic variables discussed, advanced techniques in applying predictive analysis in bringing regulation of the variables requires developing programs using AI/ML.

CO-PO Correlation Mapping Justification

Subject with Code: 15EI563 Operating Systems

2015

C No. 563

Course outcomes of OPERATING SYSTEM (15EI563)

Course Name : C563	**Year: 2015-19**
	At the end of the course, the students are able to
C563.1	Describe basic structure and functioning of OS and explain organization of computer system, and components, computing environments, network architectures, protocols and security & typical structure of OS.
C563.2	Analyze the process management, process scheduling, threads their issues and cpu scheduling algorithms
C563.3	Describe the concepts of process synchronization and analyze the problems of synchronization. Evaluate the cause and effect related to deadlocks, prevention and avoidance of the deadlocks
C563.4	Describe the techniques of memory management, virtual memory concepts, allocation and paging
C563.5	Apply appropriate disk scheduling algorithms. Describe the interfaces to file systems, file structure and implement file systems and directory structure

CO-PO mapping (Correlation Mapping)

Course Name: C563 / OPERATING SYSTEM(15EI563)												**Year: 2015-19**			
COURSE OUTCOMES	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**	**PSO3**
C563.1	**3**	**2**	**2**	**1**								**2**	**1**	**1**	**2**
C563.2	**3**	**2**	**2**	**1**								**2**	**1**	**1**	**2**
C563.3	**3**	**2**	**2**	**1**								**2**	**1**	**1**	**2**
C563.4	**3**	**2**	**2**	**1**								**2**	**1**	**1**	**2**
C563.5	**3**	**2**	**2**	**1**								**2**	**1**	**1**	**2**
C563 (Avg.)	**3.0**	**2.0**	**2.0**	**1.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**2.0**	**1**	**1**	**2**

COs-POs / PSOs Mapping	**Level**	**Justification**
CO1 → PO1	**3**	**Involves the knowledge of computer system, architectures processing fundamentals to understand the operating system services provided for various applications**
CO1 → PO2	**2**	**Supports analysis of the complex problems using basic operating system functionality**
CO1 → PO3	**2**	**Guides to design and solve complex problems using the fundamental OS structure and protocols**
CO1->PO4	**1**	**The fundamental knowledge of the operating system provides a platform for the investigation of complex problems**

CO1 → PO12	**2**	**Supports for lifelong learning on various OS architectures to solve complex problems**
CO1 → PSO1	**1**	**Fundamental concepts can be applied to measurement and control of systems**
CO1->PSO2	**1**	**The fundamentals of operating system provides a platform for the students**
CO1 → PSO3	**2**	**Maps the student's knowledge and helps in adapting to various technologies related to other disciplines**
CO2 → PO1	**3**	**Process management and thread knowledge gives a strong base for future designing and analysis**
CO2 → PO2	**2**	**Process and threads usage in the system helps analyse the issues to solve complex problems to address real time issues**
CO2 → PO3	**2**	**Various cpu scheduling algorithms in the OS guides to design the solution to vaious problems related to society**
CO2->PO4	**1**	**Concepts of process management and threads provide a platform for analyzing complex issues**
CO2 → PO12	**2**	**Latest developments in the OS features encourages for learning to match the society requirements**
CO2 → PSO1	1	**Preliminary OS architecture and structures can be mapped to solve real-time problems**
CO2->PSO2	1	**Knowledge of the basic OS structure and architecture shows a platform for updating various skill sets**
CO2 → PSO3	**2**	**Maps oneself to the technical competency from other disciplines**
CO3 → PO1	**3**	**Elementary knowledge of a deadlock situation occurring and its avoidance are applied so solve various problems in applications**
CO3 → PO2	**2**	**Analysis of problems in real time applications using the deadlock concepts and process synchronization**
CO3 → PO3	**2**	**Develop solutions for applications and problems related to society using the analysis of deadlock and process synchronization**
CO3->PO4	**1**	**Analysing the deadlock situations and synchronizing the process helps to solve complex issues**
CO3 → PO12	**2**	**Deadlock analysis to solve real time problems encourages learning**
CO3 → PSO1	**1**	**Simple domain knowledge such as OS services, multi tasking etc can be mapped to solve real-time problems**

CO3->PSO2	**1**	**Enables the students to apply the deadlock and synchronization concepts to enhance their skill sets to solve issues**
CO3 → PSO3	**2**	**Encourages oneself to technically compete with to solve real world problems**
CO4 → PO1	**3**	**Focusses on memory management required for various real time applications**
CO4 → PO2	**2**	**Techniques used in memory management and virtual memory to analyse complex problems**
CO4 → PO3	**2**	**Solutions to problems in different modern applications by using the concept of virtual memory for programming**
CO4->PO4	**1**	**Focus on memory management is possible which helps solve various memory issues**
CO4 → PO12	**2**	**Latest processors help to focus on solving issues in a better way**
CO4 → PSO1	**1**	**Analyse the design of memory systems and evaluate its performance**
CO4->PSO2	**1**	**Skill set enhancement due to the basics of virtual and memory managements will solve various issues**
CO4 → PSO3	**2**	**Across all the domains, the virtual memory concept and memory management can be mapped**
CO5 → PO1	**3**	**Better understanding in file system structure and disk scheduling while using secondary storage**
CO5 → PO2	**2**	**Focusses on analysing the issues for various applications using disk scheduling algorithms and file structures**
CO5 → PO3	**2**	**Design the solution for given application by using the features of file management to address real time issues**
CO5->PO4	**1**	**Addressing complex issues by investigating them is easily handled with the knowledge of file structures**
CO5 → PO12	**2**	**The knowledge of various file system structures and disk algorithms keeps opportunities open for learning**
CO5 → PSO1	**1**	**Concepts of directory structure, file systems and various algorithms provides new ideas to map secondary storages and manage the data better**
CO5->PSO2	**1**	**Structuring the file system along with various algorithms provide a way to work on their skill set to solve critical memory issues**
CO5 → PSO3	**2**	**OS concepts and features bridges the interdisciplinary gaps**

Course Name: (DSP-LAB)C508												Year of study: 2019-20			
Course Outcomes	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO 3**
C508.1	3	3	3	2	3							2	3	1	2
C508.2	3	3	3	2	3							2	3	1	2
C508.3	3	3	3	2	3							2	3	1	2
C508.4	3	3	3	2	3							2	3	1	2
C508.5	3	3	3	2	3							2	3	1	2
C504	3	3	3	2	3							2	3	1	2

COs Mapping	POs Mapping	Level	Justification
CO1	**PO1**	3	The knowledge of engineering mathematics and fundamentals are applied to use the sampling concept to solve various problems
	PO2	3	Identify and analyze issues related to analog, digital signals and sampling using the fundamentals of engineering to solve real time problems.
	PO3	3	Capable of analyzing any complex issues using the engineering fundamentals along with sampling theory and design appropriate methods and solutions to solve real time issues
	PO4	2	Investigate the complex issues by understanding the problems using their fundamental engineering knowledge and the digital signal processing concepts
	PO5	3	Exposure to signal processing basics and concepts using the lab tools and software gives the students a confidence to use the resources and techniques for analyzing higher end issues and provide appropriate conclusions
	PO12	2	Fundamental concepts with hands on experience provide the students a platform for learning and preparing themselves to the technological changes

	PSO1	3	The fundamental concepts of signal processing provide a confident environment to apply the specific knowledge to various systems and models to solve new problems
	PSO2	1	A strong basic knowledge of DSP and the fundamentals provide the students a strong skill set to solve issues in any field of engineering
	PSO3	2	Digital signal processing with hands on experience in the concepts help them to adapt to any field of engineering and contribute to the changing technologies
CO2	**PO1**	3	The knowledge of engineering mathematics and fundamentals such as convolution, correlation are applied to use the sampling concept to solve various problems
	PO2	3	Identify and analyze issues related to analog, digital signals and correlation in real world and solve them using the fundamentals of engineering
	PO3	3	Capable of analyzing any complex issues using the engineering fundamentals along with convolution and correlation concepts and design appropriate methods and solutions to solve real time issues
	PO4	2	Investigate the complex issues by applying the concept of convolution and correlation and the digital signal processing concepts
	PO5	3	Exposure to signal processing basics and concepts like convolution, correlation using the lab tools and software gives the students a confidence to use the resources and

			techniques for analyzing higher end issues and provide appropriate conclusions
	PO12	2	Fundamental concepts with hands on experience provide the students a platform for learning and preparing themselves to the technological changes
	PSO1	3	The fundamental concepts of signal processing provide a promising environment to apply the specific knowledge to various systems and models to solve new problems
	PSO2	1	Building a strong skill set with the basic knowledge of DSP and the fundamentals of convolution and corrrelation provide the students a strong skill set to solve issues in any field of engineering
	PSO3	2	Digital signal processing with hands on experience in the concepts help them to adapt to any field of engineering and contribute to the changing technologies as it as can be applied across various disciplines
CO3	**PO1**	3	The discrete signals, generation and handling of these signals along with the engineering mathematics are applied to solve various problems
	PO2	3	Identify and analyze issues related to discrete fourier transforms and the frequency analysis in spectrum and solve them using the fundamentals of engineering
	PO3	3	Analyze any complex issues using the engineering fundamentals along with the concepts of discrete domain signals and frequency spectrum to design appropriate methods and solutions to solve real time issues

	PO4	2	Investigate the complex issues by understanding the problems using their fundamental engineering knowledge and the digital signal processing concepts of discrete signals.
	PO5	3	Exposure to signal processing basics and concepts of DFT using the lab tools and software gives the students a confidence to use the resources and techniques for analyzing higher end issues and provide appropriate conclusions
	PO12	2	Fundamental concepts with hands on experience on discrete fourier transform provide the students a platform for learning and preparing themselves to the technological changes
	PSO1	3	The fundamental concepts of discrete fourier transformsignal processing provide a promising environment to apply the specific knowledge to various systems and models to solve new problems
	PSO2	1	Building a strong skill set with the basic knowledge of DSP and the fundamentals of convolution and corrrelation provide the students a strong skill set to solve issues in any field of engineering
	PSO3	2	Digital signal processing with hands on experience in the concepts of discrete signals and frequency spectrum help them to adapt to any field of engineering and contribute to the changing technologies as it as can be applied across various disciplines
CO4	**PO1**	3	The basic concept of filters, types of filters and applicatioin of these concepts along with the engineering mathematics to solve various problems

	PO2	3	Identify and analyze issues related to discrete fourier transforms and the frequency analysis in spectrum and solve them using the fundamentals of engineering
	PO3	3	Analyze any complex issues using the engineering fundamentals along with the concepts of filters and its types to design appropriate methods and solutions to solve real time issues
	PO4	2	Investigate the complex issues by understanding the problems using their fundamental engineering knowledge and the digital signal processing concepts of discrete signals and filter techniques.
	PO5	3	Exposure to signal processing basics and concepts of Finite and infinite impulse response filters and its types using the lab tools and software gives the students a confidence to use the resources and techniques for analyzing higher end issues and provide appropriate conclusions
	PO12	2	Fundamental concepts with hands on experience on FIR and IIR filtersprovide the students a platform for learning and preparing themselves to the technological changes
	PSO1	3	The fundamental concepts of analog and digital filters and its types provide a promising environment to apply the specific knowledge to various systems and models to solve new problems
	PSO2	1	Building a strong skill set with the basic knowledge of DSP and the fundamentals of digital and analog filter and its types provide the students a strong skill set to solve issues in any field of engineering

	PSO3	2	Digital signal processing with hands on experience in the concepts of filters, various types make the students adapt to any field of engineering and contribute to the changing technologies as it as can be applied across various disciplines
CO5	**PO1**	3	The basic concept of sampling, convolution, filters, types of filters and the hands on experience using software tools provide a sufficient knowledge along with the engineering mathematics to solve various problems
	PO2	3	Identify and analyze issues related to the basics of digital signal processing, discrete fourier transforms and the frequency analysis in spectrum along with filter types and solve them using the fundamentals of engineering
	PO3	3	Analyze any complex issues using the signal processing fundamentals along with the concepts of filters and its types to design appropriate methods and solutions to solve real time issues
	PO4	2	Fundamental signal processing concepts of discrete signals and filter techniques worked on the software tools provide the students a strong platform to Investigate the complex issues
	PO5	3	Hands on experience to signal processing basics and concepts of Finite and infinite impulse response filters and its types using the lab tools and software gives the students a confidence to use the resources and techniques for analyzing higher end issues and provide appropriate conclusions
	PO12	2	Fundamental concepts with hands on experience on FIR and IIR filters provide the students a platform for learning and preparing themselves to the technological changes

	PSO1	3	The fundamental concepts of analog and digital filters and its types experienced on the software tools and the processor kit provide a promising environment to apply the specific knowledge to various systems and models to solve new problems
	PSO2	1	Building a strong skill set with experimenting the basic knowledge of DSP and the fundamentals of digital and analog filter and its types provide the students a strong skill set to solve issues in any field of engineering
	PSO3	2	Digital signal processing with hands on experience using software tools and the processor kit in the concepts of filters, various types make the students adapt to any field of engineering and contribute to the changing technologies as it as can be applied across various disciplines

Analog and Digital Communication Systems (15EI61)

Course Name:C601	Year:2019-20
	At the end of the course, the students are able to
C601.1	Analyse simple systems for generation and detection of AM, DSB, SSB and VSB signals.
C601.2	Describe the concepts and performance of frequency modulation schemes.
C601.3	Explain the concepts of sampling theorem, and pulse modulation and demodulation techniques
C601.4	Analyse systems for generation and detection of digital modulation systems and assess its performance
C601.5	Describe the operation of WPAN technologies, protocols and cellular networks,

Analog and Digital Communication Systems (15EI61)

Course Name: C601												Year of study: 2019-20			
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
C601.1	3	2	2									2	3	2	2
C601.2	3	3	2									2	2	2	1
C601.3	3	3	2									3	2	2	2
C601.4	3	2	2									2	3	2	2
C601.5	3	3	2									2	2	2	1
C503 avg	3.0	2.6	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.4	2.0	1.6

CO-PO Correlation Mapping Justification

Subject with Code: 15EI661 Mobile Communication

2015- Nisha Batch

C No. 661

Course outcomes of MOBILE COMMUNICATION (15EI661)

Course Name : C661	Year: 2015-19
	At the end of the course, the students are able to
C661.1	Acquire the knowledge of Radio frequencies, their regulations, transmission of signals, various multiplexing techniques such as SDMA, FDMA, CDMA, TDMA.
C661.2	Describe the process of accessing the medium for wireless communication, problems associated with it, the concepts of various multiplexing techniques
C661.3	Understand the Bluetooth concepts, Internet protocol (IP) versions and their mobility support
C661.4	Analyze the important issues involved in adhoc routing and networking.
C661.5	Acquire knowledge on the cellular networks like- GSM, UMTS and various satellites like GEO,LEO, MEO and their communication, TCP layer

CO-PO mapping (Correlation Mapping)

Course Name: C661 / MOBILE COMMUNICATION (15EI661)													Year: 2015-19			
COURSE OUTCOMES		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C15EI661.1	CO 1	3	2	2	1								1	1	1	2
C15EI661.2	CO 2	3	2	2	1								1	1	1	2
C15EI661.3	CO 3	3	2	2	1								1	1	1	2
C15EI661.4	CO 4	3	2	2	1								1	1	1	2
C15EI661.5	CO 5	3	2	2	1								1	1	1	2
C661(avg)		3.0	2.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	2.0

COs-POs / PSOs Mapping	Level	Justification
CO1 → PO1	3	Involves the knowledge of basic communication fundamentals to understand their implementations on various applications
CO1 → PO2	2	Supports analysis of the complex problems using basic mathematics
CO1 → PO3	2	Guides to design and solve complex problems using the fundamental concepts like various multiplexing techniques
CO1->PO4	1	The concept of radio frequencies and various multiplexing techniques gives a good hand to investigate various problems
CO1 → PO12	1	Radio frequency signals and their application encourages for lifelong learning

CO1 → PSO1	**1**	**Fundamental concepts can be applied to measurement and control of systems**
CO1->PSO2	**1**	**Finding solution to various issues is possible through the knowledge of multiplexing**
CO1 → PSO3	**2**	**Maps the student's knowledge and helps in adapting to various technologies related to other disciplines**
CO2 → PO1	**3**	**Fundamental knowledge about the wireless communication provides a strong base for future designing and analysis**
CO2 → PO2	**2**	**Wireless communication problems and various multiplexing techniques guides to analyse the real time issues**
CO2 → PO3	**2**	**Development of solutions to the problems related to wireless communication in real world applications**
CO2->PO4	**1**	**Multiplexing techniques in communication will be the guideline to investigate on various issues**
CO2 → PO12	**1**	**Requirements in the real world applications always encourages for learning to match the society requirements**
CO2 → PSO1	1	**Basic communication concepts can be mapped to solve real-time problems**
CO2->PSO2	1	**Multiplexing techniques in communication will be providing a platform for various skill sets**
CO2 → PSO3	**2**	**Maps oneself to the technical competency from other disciplines**
CO3 → PO1	**3**	**Focussed understanding of various communication protocols can be applied to various applications**
CO3 → PO2	**2**	**Analysing the intensity of problems in various applications supported by applying communication protocols**
CO3 → PO3	**2**	**Develop solutions for applications and problems related to society using different technologies**
CO3->PO4	**1**	**Focus on various communication protocol guides to solve and investigate complex**
CO3 → PO12	**1**	**Recent technology learnings encourages to address the problem**
CO3 → PSO1	**1**	**Fundamentals of communication can be mapped to solve real-time problems**
CO3->PSO2	**1**	**Concepts of Bluetooth and other communication concepts provide platform for skillset development to solve various issues**

CO3 → PSO3	**2**	**Encourages oneself to technically compete with to solve real world problems**
CO4 → PO1	**3**	**Focusses on adhoc communication and networking for various real time applications**
CO4 → PO2	**2**	**Networking protocols help to analyse complex problems**
CO4 → PO3	**2**	**Solutions to problems can be designed in different modern applications by various protocols and adhoc connections**
CO4->PO4	**1**	**Fundamentals of networking issues and adhoc protocols encourages to investigate the issues and solve them**
CO4 → PO12	**1**	**Latest adhoc communication updates and networking issues help to focus on solving issues in a better way**
CO4 → PSO1	**1**	**Communication knowledge with all latest technology updates eases the problem solving**
CO4->PSO2	**1**	**Communication protocols across domains provide a platform for working on the skill set to solve issues**
CO4 → PSO3	**2**	**Across all the domains, communication application can be mapped**
CO5 → PO1	**3**	**Better understanding of the satellites and communication in various orbits**
CO5 → PO2	**2**	**Focusses on analysing the practical issues related to communication using satellites**
CO5 → PO3	**2**	**Design the solution for given application by analysing the networking and transport layers to address real time issues**
CO5->PO4	**1**	**Fundamentals of networking and transport layer protocols encourages to investigate the issues and solve them**
CO5 → PO12	**1**	**The knowledge of recent communication protocols keeps opportunities open for learning**
CO5 → PSO1	**1**	**Concepts of communication through OSI layers supports to solve complex issues**
CO5->PSO2	**1**	**Communication protocols across domains provide a platform for working on the skill set to solve issues**
CO5 → PSO3	**2**	**Communication protocols and methods to address issues bridges the interdisciplinary gaps**

Course Information Sheet

Faculty **Dr. Mallikarjun H M**

Email mallikarjun18@gmail.com **or** mallikarjun.h.m@rnsit.ac.in

Contact Number **9743207651**

Contact Time **4hrs/week**

Class Room 104

Program: Electronics & Instrumentation Engineering	**Degree:** B.E
Course: Real Time Operating System	**Semester:** VII
Course Code: 15EI744	**Regulation / Scheme:** 2015
No. of Lecture Hours / Week: 04 **Total No. of Lecture Hours :** 40	**IA Marks:** 20 **Exam Marks:** 80
	Exam Hours: 03

Course outcomes of Real Time Operating System (15EI744)

Course Name: C744	
	At the end of the course, the students are able to
C744.1	Describe theoretical and practical concepts, and functioning of operating system.
C744.2	Distinguish a real-time system from other systems
C744.3	Discuss the specifications, design requirements and kernel techniques in development of RTOS.
C744.4	Evaluate real time operating systems based on real time applications with different models.
C744.5	Implement the real-time operating system principles.

CO-PO mapping (Correlation Mapping)

Course Name: C744/ **Real Time Operating System** (15EI744)															
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C744.1	3	2	2	1								2	1	1	2
C744.2	3	2	2	1								2	1	1	2
C744.3	3	2	2	1								2	1	1	2
C744.4	3	2	2	1								2	1	1	2
C744.5	3	2	2	1								2	1	1	2
C744 (Avg.)	3.0	2.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	1.0	1.0	2.0

Course Information Sheet

Faculty **Dr. Mallikarjun H M**

Email mallikarjun18@gmail.com **or** mallikarjun.h.m@rnsit.ac.in

Contact Number **9743207651**

Contact Time **4hrs/week**

Class Room ARM Processor Lab

Program: Electronics & Instrumentation Engineering	**Degree:** B.E
Course: ARM Processor Lab	**Semester:** VII
Course Code: 15EIL77	**Regulation / Scheme:** 2015
No. of Lecture Hours / Week: 03 (1I+2P) **Total No. of Lecture Hours :** 42	**IA Marks:** 20 **Exam Marks:** 80
	Exam Hours: 03

Course outcomes of ARM Processor Lab (15EIL77)

Course Name: C707	
	At the end of the course, the students are able to
C707.1	Write ALP for implementation of specific arithmetic or logical operations.
C707.2	Write programs to demonstrate functioning of various devices interfaced to ARM processor.
C707.3	Develop programs for ARM processors to implement real world problems.
C707.4	Design and develop mini projects.

CO-PO mapping (Correlation Mapping)

Course Name: C707/ ARM Processor Lab (15EIL77)															
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C707.1	2	3	2	2								3	3	1	3
C707.2	2	3	1	2								3	3	1	3
C707.3	2	3	2	2								3	3	1	2
C707.4	2	3	1	2								3	3	1	2
C707 (Avg.)	2.0	3.0	1.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	1.0	2.5

B. E. Electronics and Instrumentation Engineering

Semester VII

Automation in Process Control

(15EI71)

After studying this course, the students will be able to;

C701.1 Describe the architecture, functioning and applications of PLC in automation.

C701.2 Recognize various I/O modules of PLC and apply programming concepts to interface peripherals.

C701.3 Design and analyze the ladder diagram program using different PLC instruction sets.

C701.4 Discuss the various distributed control system and its architecture to develop an automation system.

C701.5 Analyze the basics of SCADA and communication protocols used in automation industries.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C701.1	3	3	2	2	3							3	3	2	3
C701.2	2	3	2	2	2							2	2	1	3
C701.3	3	2	3	2	2							3	3	2	2
C701.4	2	3										3	2	1	2
C701.5	3	2										3	3	1	3
Average	**2.6**	**2.6**	**2.3**	**2.0**	**2.3**							**2.8**	**2.6**	**1.4**	**2.6**

ARM PROCESSOR (18EI72)

Course Name:C703	Year:2020-21
	At the end of the course, the students are able to
C702.1	Depict the organization, architecture, bus technology, memory and operation of the ARM microprocessors.
C702.2	Employ the knowledge of Instruction set of ARM processors to develop basic Assembly Language Programs.
C702.3	Recognize the importance of the Thumb mode of operation of ARM processors and develop C programs for ARM processors.
C702.4	Describe the techniques involved in Exception and Interrupt handling in ARM Processors and understand the fundamental concepts of Embedded Operating Systems.
C702.5	Develop embedded C programs to interact with Built in Peripherals and develop programs using RTOS (Micro C/OS) on ARM based development boards.

Table 3.1.2.7 CO PO/PSO of matrix of ARM PROCESSOR (18EI72)

Course Name: C703												Year of study: 2020-21			
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C702.1	3	3	2	3	2							1	3	3	3
C702.2	3	3	2	3	2				2			1	3	3	3
C702.3	3	3	3	3	2				2			2	3	3	2
C702.4	3	2	3	2	1				2			2	3	2	2
C702.5	3	3	3	1	1							2	2	2	2
C702 avg	**3.0**	**2.8**	**2.6**	**2.4**	**1.6**	**0.0**	**0.0**	**0.0**	**1.2**	**0.0**	**0.0**	**1.6**	**2.8**	**2.6**	**2.4**

Course Name: (Virtual Instrumentation)C753												Year of study: 2015-16			
Course Outcomes	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO 3**
C753.1	3	2	2	2	2							2	3	2	2
C753.2	3	2	2	2	2							2	3	2	2
C753.3	3	2	2	2	2							2	3	2	2
C753.4	3	2	2	2	2							2	3	2	2
C753.5	3	2	2	2	2							2	3	2	2
C753	3	2	2	2	2							2	3	2	2

B. E. Electronics and Instrumentation Engineering

Semester VIII

Neural Networks and Fuzzy Logic System

(15EI81)

After studying this course, the students will be able to;

C801.1 Discuss the single layer, multilayer network architecture and understanding the differences between biological neural network and ANN.

C801.2 Analyze the ANN for pattern classification.

C801.3 Develop and configure ANNs with different types of functions and learning algorithms for real world problems

C801.4 Discuss the fundamentals of fuzzy logic, implementation and their functions.

C801.5 Apply fuzzy logic concepts in building automated control systems.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C801.1	3	3	3	2	2	1						3	1	2	3
C801.2	2	3	3	2	2	1						2	2	2	2
C801.3	2	2	2	3	2	1						3	1	3	3
C801.4	3	3	2	3	3	1						3	1	3	2
C801.5	3	2	3	3	2	1						3	1	2	2
Average	**2.6**	**2.6**	**2.6**	**2.6**	**2.2**	**1.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1.0**	**2.8**	**1.2**	**2.4**	**2.4**

LASERs and Optical Instrumentation 15EI82
Staff : Dr. Andhe Pallavi

Course Outcomes:

After studying this course, students are able to:

1. Explain the principle and working of Laser systems
2. Discuss the engineering applications of laser systems
3. Discuss the fundamentals of optical fiber communications
4. Evaluate the design of optical fibers
5. Apply fiber optic laser systems in medical field
6. Design the laser output modifications to facilitate engineering applications of laser systems

Course Name : C802															Year of study: 2018 - 19
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C802.1	3	3	3	1								3	3		2
C802.2	3	3	3	1		1						3	3		2
C802.3	3	3	3	1		1						3	3		3
C802.4	3	3	3	1								3	3		3
C802.5	3	3	3	1		1	3	2				3	3		3
C802.6	3	3	3	1								1	3		1
C802	3.0	3.0	3.0	1.0	0.0	1.0	3.0	2.0	0.0	0.0	0.0	2.7	3.0	0.0	2.3

CIE TARGET: 50% ; SEE TARGET: 6.75 (Average Grade Point)

SEE targets	
0-4	0
4.01-5.99	1
6.00-6.99	2
7 & above	3

CIE TARGET				LEVEL
75%	% STUDENTS MUST SCORE	50	% & ABOVE	3
60%	% STUDENTS MUST SCORE	50	% & ABOVE	2
45%	% STUDENTS MUST SCORE	50	% & ABOVE	1

INTERNAL ASSESSMENT Target>=50			
Test Assessment			Qz & A
CO1	34	65%	98%
CO2	40	77%	98%
CO3	29	56%	98%
CO4	24	46%	98%
CO5	44	85%	98%
CO6	27	52%	98%
Average %		63%	98%
Average Level		1.43	0.74

Internal Marks Weightage	
Tests IA	Quiz + Assign
75%	25%

CLASS STRENGTH	52
SET TARGET FOR INTERNAL ASSESSMENT (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Average CO Attainment in CIE = 60%

Course outcome Attainment:

Course outcome Attainment of LASERs and Optical Instrumentation (15EI82) Year: 2018 -19												
Course Name	CO1		CO2		CO3		CO4		CO5		CO6	
	%	Level	%	Level	%	Level	%	Level	%	Level	%	Level
C802	65	2	77	3	56	1	46	1	85	3	52	2
Max Marks	54*		36		63		27		54		36	

* -- **6 questions of 9 marks each = 54**

Course outcome attainment of 2015-19 EI batch in Eighth semester
Final CO Attainment level (20% CIE + 80% SEE) → Level 2
(SEE Average Grade Point : 6.60 → Level 2)
Table 3.3.2.8: CO-PO attainment of 2015-19 EI batch in Eighth semester

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C802	2.0	2.0	2.0	0.7	0.0	0.7	2.0	1.3	0.0	0.0	0.0	1.8	2.0	0.0	1.6
Target	3.0	3.0	3.0	1.0	0.0	1.0	3.0	2.0	0.0	0.0	0.0	2.7	3.0	0.0	2.3

LASERs and Optical Instrumentation
10IT81 / 10EI81 / 15EI82
Staff : Dr. Andhe Pallavi

Course Outcomes:

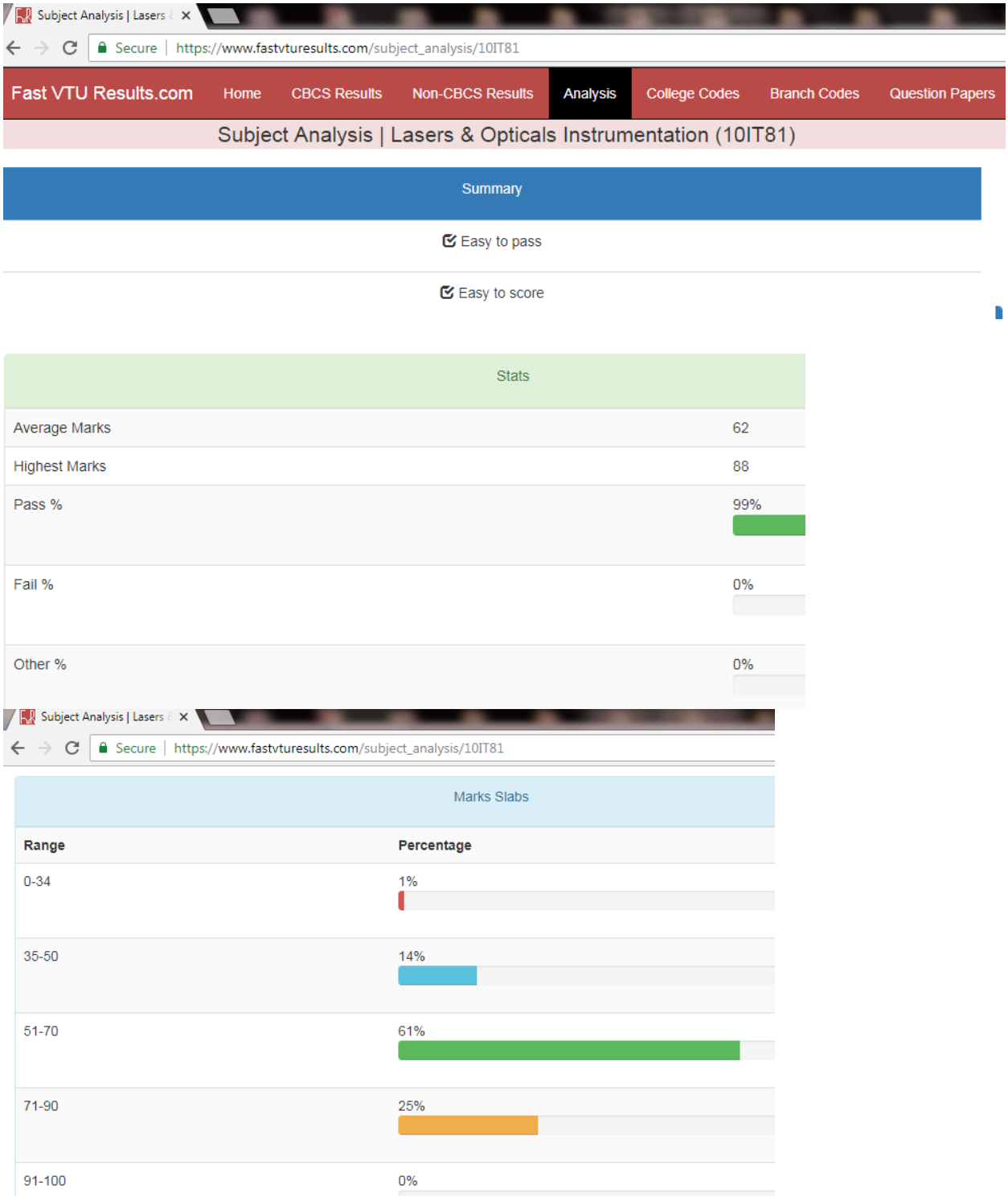
After studying this course, students will able to:

1. Relate to the concepts of various lasers (construction/ operation / applications of the four classes of lasers namely Doped insulator, Semiconductor, Gas and Liquid dye lasers).
2. Analyze the various enhancement techniques involved laser generation.
3. Discuss the appropriate usage of different lasers in various applications.
4. Explicate the essentials of optoelectronics and its applications.

CO1: Explain the principle and working of Laser systems
CO2: Discuss the engineering applications of laser systems.
CO5: Apply fiber optic laser systems in medical field
CO3: Discuss the fundamentals of optical fiber communications.
CO4: Evaluate the design of optical fibers.
CO6: Design the laser output modifications to facilitate engineering of laser systems.

Course Outcomes: After studying this course, students will be able to:
1. Explain the principle and working of Laser system.
2. Discuss the engineering applications of laser systems.
3. Discuss the fundamentals of optical fiber communications.
4. Evaluate the design of optical fibers.
5. Apply fiber optic laser systems in medical field.

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 12	PS O1	PS O2	PS O3
C801.1	3	3	3	1				3	3	1	1
C801.2	3	3	3	1				3	3	1	1
C801.3	3	2	3	1		2	2	3	3	1	1
C801.4	3	3	3	2		1	2	3	3	2	1
C801 (avg)	3	2.75	3	1.25		1.5	2	3	3	1.25	1



Toppers

Name	USN	Marks
PREETI UDAPUDI	1rn12it028	88

S.MOUNIKA	3pg12it008	88
DIVYA KUNJAPPA.S	1rn11it018	86
VIGNESH.P.R	1ds12it047	86
FOUZIA B	3pg12it004	86
PRADEEP .K	1rn12it026	85
SYED TASNEEM WAFA	3pg12it009	85
T.SAMIYA	3pg12it011	85
SHREEDEVI B R	1kn09it026	84
SUMANGALA N SUNADHOLI	1ds12it042	84
GOUTAM GAJANAN BHAT	1rn12it013	84
SANJANA.A.M	1bi12it041	84
RAJATH V	1rn12it032	84
RADHIKA P MANSABDAR	3kb10it035	83
PRAGATHI V B	1js12it025	83
SNEHA SHREE D S	1rn12it050	83
RASHMITHA RAO U	1rn12it036	83
SUNIL KUMAR M	3vc10it020	82
ASHOK KUMAR	3vc11it400	82
JAGADEK JEWARGI	1rn10it019	82

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
2. Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations
4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice – **laser safety**
7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development - **Usage of fiber optic imaging in medicine, industrial automation**
8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice – **Usage of fiber optic imaging in medicine, industrial automation**

Program Specific Outcomes (PSOs)
Instrumentation Engineers are able to:

1. Domain Knowledge: relate the fundamental concepts of Instrumentation (measurement, control, operation, monitoring and maintenance) to varied measurement systems and models.
2. Skill Set: design and develop automatic control system for the given specifications in the allied fields of engineering.
3. Adaptability: adapt and migrate to changing interdisciplinary technologies to provide improvised solutions.

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
805	15EIP85	Project work phase II

Staff: Mrs. Sneha G Chachadi

Course outcomes of Project work phase II (15EIP85)

1. Design and develop the project and be able to defend it.
2. Develop critical thinking and problem-solving skills.
3. Learn to use modern tools and techniques.
4. Develop skills to work in a team to achieve common goal, project management and finance.
5. Develop skills of self-learning, evaluate their learning and take appropriate actions to improve it.
6. Prepare themselves for life-long learning to face the challenges and support the technological changes to meet the societal needs.

CO-PO mapping (Correlation Mapping)

Course Name: C805														Year: 2015-19
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PSO 3
C805.1	3	3	3				2	2	3	2	1		2	3	2
C805.2	3	3	3	3	3			1	2			2		1	
C805.3	3	2	2	1					2	1		1	2		
C805.4	3	2	3			2			3	2	3	2			
C805.5	3	3	3	1					3					1	
C805.6	2	2	3	1					3	1		3			
C805 (Avg.)	2.8	2.5	2.8	1.5	3	2	2	1.5	2.7	1.5	2	2	2	1.7	2

Course Information Sheet

Faculty **Dr. Mallikarjun H M**

Email mallikarjun18@gmail.com **or** mallikarjun.h.m@rnsit.ac.in

Contact Number **9743207651**

Contact Time **4hrs/week**

Class Room 104

Program: Electronics & Instrumentation Engineering	**Degree:** B.E
Course: Industrial Process Instrumentation	**Semester:** VIII
Course Code: 15EI832	**Regulation / Scheme:** 2015
No. of Lecture Hours / Week: 04 **Total No. of Lecture Hours :** 40	**IA Marks:** 20 **Exam Marks:** 80
	Exam Hours: 03

Course outcomes of Industrial Process Instrumentation (15EI832)

Course Name: C832	
	At the end of the course, the students are able to
C832.1	Sketch the typical instrumentation and control strategy in the process industries like paper, pulp, cement, power and steel plants.
C832.2	List the variable to be monitored and controlled in the above said process industries.
C832.3	Describe the instrumentation, control requirements and complete functioning of the above said industries.
C832.4	Analyze the hardware and software tools required for the above said process industries.
C832.5	Design and develop instrumentation and control strategy for simple process industry

CO-PO mapping (Correlation Mapping)

Course Name: C832/ **Industrial Process Instrumentation (15EI832)**															
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C832.1	3	3	1	2				2				3	3	1	2
C832.2	3	3	1	1				2				3	3	1	2
C832.3	3	3	1	1				3				3	3	1	2
C832.4	3	3	1	1				3				3	3	1	2
C832.5	3	3	2	1				3				3	3	1	2
C832(Avg.)	3.0	3.0	1.2	1.2	0.0	0.0	0.0	2.6	0.0	0.0	0.0	3.0	3.0	1.0	2.0

B. E. Electronics and Instrumentation Engineering

Semester VIII

Internship / Professional Practice

(15EI84)

After studying this course, the students will be able to;

C804.1 Apply knowledge and skills learnt to acquire practical experience within industry in which the internship is done.

C804.2 Experience the activities, functions of professionals and develop oral and written communication skills.

C804.3 Recognize the areas for future knowledge and skill development.

C804.4 Acquire the basic knowledge of administration, marketing, finance and economics.

C804.5 Develop the skills to enable lifelong learning.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C804.1	3	3	3	3	3			3	2	2	1	3	3	3	3
C804.2	3	2	1						3	3	3	3	1	1	3
C804.3	3	3	2	3	3			2		3	3	3	1	3	2
C804.4				2		2	1	3	3	3	3	3	1	2	3
C804.5	3	3	2	3	3			3	3	3	3	3	3	3	3
Average	**3.0**	**2.8**	**2.0**	**2.8**	**3.0**	**2.0**	**1.0**	**2.8**	**3.3**	**2.8**	**2.6**	**3.0**	**1.8**	**2.4**	**2.8**

Course Name:C806	Year:2015-16
	At the end of the course, the students are able to
C806.1	Develop knowledge in the field of Electronics & Instrumentation Engineering and other disciplines through independent learning and collaborative study.
C806.2	Identify and discuss the current, real-time issues and challenges in engineering & technology.
C806.3	Develop written and oral communication skills.
C806.4	Explore concepts in larger diverse social and academic contexts.
C806.5	Apply principles of ethics and develop the skills to enable life-long learning.

Course Name: (Seminar)C86								Year of study: 2015-16							
Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C86.1	3	3	3	3	3			3	2	2	1	3	3	2	3
C86.2	3	3	3	2	2			3	2	3	1	3	3	2	3
C86.3	3	2						3	2	3	1	3	2	1	2
C86.4	3	1				1		2	1	2		3	1	1	2
C86.5	3	2	2	2				2	2		1	3	2	3	3
C86	3	2	2	2	2							2	3	2	2

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME	FACULTY NAME
302	18EI32	ELECTRONIC INSTRUMENTATION AND MEASUREMENTS	Madhura G

Course outcomes of Electronic Instrumentation and Measurements

Course Name : C302	Year: 2018-22
C302.1	Describe the methods, functions, applications and static characteristics of various types of measurement systems and identify the type of errors in measuring instruments.
C302.2	Examine the principle, construction and working of different analog and digital measuring instruments like voltmeters, ammeters multimeters and frequency meters.
C302.3	Illustrate the principle and working of various types of analog and digital CROs and their usage in the measurement of various electrical parameters.
C302.4	Discuss the constructional and functional aspects of various types of electronic test equipments like RF and AF signal generators and electrical bridge networks for the measurement of R, L and C
C302.5	Describe methods, construction, working, advantages and disadvantages of analog and digital display systems and recorders

CO-PO mapping (Correlation Mapping)

Course Name: C302															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C302.1	3	3	2	1	-	-	-	-	-	1	-	1	3	1	1
C302.2	3	3	2	1	-	-	-	-	-	1	-	1	3	2	2
C302.3	3	2	2	1	-	-	-	-	-	1	-	1	3	1	2
C302.4	3	2	2	1	-	-	-	-	-	1	-	1	3	1	1
C302.5	3	3	2	1	-	-	-	-	-	1	-	1	3	1	1
C302 (Avg.)	3.0	2.6	2.0	1.0						1.0		1.0	3.0	1.2	1.4

Course outcome Attainment:

Course outcome Attainment of Electronic Instrumentation and Measurements (18EI32) Year: 2018-22										
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C302	80%	3	80%	3	80%	3	80%	3	80%	3

Course outcome Attainment of Electronic Instrumentation and Measurements (18EI32)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C505	80%	3	90%	3	77.2%	3	3

CIE targets		SEE targets		
Below 45	0	0-4	<45	0
45-60	1	4.01-5.99	45-60	1
60-75	2	6.00-6.99	60-70	2
75 above	3	7 & above	70&above	3

Final PO Attainment

PO Attainment of Electronic Instrumentation and Measurements(18EI32)													Year: 2018-22		
Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS 02	PS03
C302	3.0	2.6	2.0	1.0						1.0		1.0	3.0	1.2	1.4

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME	Faculty
306	18EI36	NETWORK ANALYSIS	CG

Course outcomes of NETWORK ANALYSIS

Course Name : C306	**Year: 2018-22**
C306.1	Solve Circuits using source transformation, mesh and nodal analysis
C306.2	Apply various theorems to solve the given network
C306.3	Infer and evaluate the transient response and Steady state response
C306.4	Obtain the two-port network parameters of the given two port network
C306.5	Analyze the series resonant and parallel resonant circuits.
C306.6	Realize the solution of the resistive networks using tie-set/ cut-set network topology concepts

CO-PO mapping (Correlation Mapping)

Course Name: C306														**Year: 2018-22**
COURSE OUTCOMES	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS O2**	**PS O3**
C306.1	3	3	3	3								3	2	2	1
C306.2	3	3	3	3								3	1	1	
C306.3	3	2	2	2								3	2	1	
C306.4	3	3	3	3								3	2	2	
C306.5	3	3	3	3								3	2	2	
C306.6	3	2	3	3								3	1		
C306 (Avg.)	**3**	**2.7**	**2.8**	**2.8**								**3**	**1.7**	**1.6**	**1**

Course outcome Attainment:

Course outcome Attainment of Network Analysis (18EI36)												**Year: 2018-22**
Course Name	**CO1**		**CO2**		**CO3**		**CO4**		**CO5**			
	%	**Level**	**%**	**Level**	**%**	**Level**	**%**	**Level**	**%**	**Level**	**%**	**Level**
C505	83	3	66	2	79	3	87	3	68	2	83	3

Course outcome Attainment of Network Analysis(18EI36)							**Final attainment level**
Course Name	**CIE***				**SEE**		
	CO(%)	**Level (X1)**	**Q&A(%)**	**Level (X2)**	**SEE%**	**Level (X3)**	
C505	78%	3	96%	3	76.26	3	3

CIE targets		**SEE targets**		
Below 45	0	0-4	<45	0
45-60	1	4.01-5.99	45-55	1
60-75	2	6.00-6.99	55-65	2
75 above	3	7 & above	65&above	3

Final PO Attainment

PO Attainment of Network Analysis (18EI36)														**Year: 2018-22**	
Course	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PS0 2**	**PS0 3**
C306	**3**	**2.7**	**2.8**	**2.8**								**3**	**1.7**	**1.6**	**1**

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME	FACULTY
501	18EI35	TRANSDUCERS AND INSTRUMENTATION	S J SAVITA

Course outcomes of Transducers and Instrumentation

Course Name: C305	Year: 2018-22
C305.1	Identify the suitable transducer for the specific application of measurement and apply suitable noise removal technique in the design of measuring instruments.
C305.2	Interpret and analyse the static and dynamic characteristics of instruments.
C305.3	Discuss the principle and working of various transducers for displacement and level measurements
C305.4	Apply functional aspects and use transducers for strain,force and torque measurement.
C305.5	Describe functional aspects, usage of different transducers for pressure, speed, sound and thickness measurement.

CO-PO mapping (Correlation Mapping)

Course Name: C505															
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C305.1	2	3	2	2								3	3	1	3
C305.2	2	3	1	2								3	3	1	3
C305.3	2	3	2	2								3	3	1	2
C305.4	2	3	1	2								3	3	1	2
C305.5	2	3	1	1								3	3	1	3
C305 (Avg.)	2.0	3.0	1.4	1.8								3.0	3.0	1.0	2.6

Course outcome Attainment:

Course outcome Attainment of Transducers and Instrumentation (18EI35)										Year: 2018-22
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C505	77.78%	3	77.78%	3	77.78%	3	77.78%	3	77.78%	3

Course outcome Attainment of Transducers and Instrumentation (18EI35)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C505	77.78%	3		3	66.09%	2	

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of Transducers and Instrumentation (18EI35)												Year: 2018-22			
Course Name	**PO1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS 02**	**PS03**
C505	1.33	0.93	1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.67	1.73	1.33

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME	Faculty
501	18EI45	PROCESS INSTRUMENTATION	S J Savita

Course outcomes of Process Instrumentation

Course Name: C405	Year: 2018-22
C405.1	Discuss the construction and working Principle of transducers/sensors for the measurement of temperature for various ranges.
C405.2	Apply suitable Flow meters for measurement of fluid flow in industrial applications.
C405.3	Select the appropriate instruments for measurement of vibration and density.
C405.4	Install and analyze the transducers/sensors for the measurement of viscosity and turbidity.
C405.5	Choose the suitable sensors/instrument for the measurement of Humidity and Moisture

CO-PO mapping (Correlation Mapping)

Course Name: C505												Year: 2018-22			
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C405.1	3	2	2									2	3	1	2
C405.2	3	2	2									1	3	2	2
C405.3	3	2	3									2	3	1	1
C405.4	3	2	2									1	3	2	2
C405.5	3	2	2									1	3	2	1
C405 (Avg.)	3	2	2.2									1.4	3	1.6	1.6

Course outcome Attainment:

Course outcome Attainment of Process Instrumentation (18EI45) Year: 2018-22										
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C405	80%	3	80%	3	80%	3	80%	3	80%	3

Course outcome Attainment of Process Instrumentation (18EI45)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C405	80%	3	82%	3	8.64%(grade point)	3	3

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of Process Instrumentation (18EI45) Year: 2018-22														
Course Name	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS 02**	**PS03**
C505	**3**	**2**	**2.2**									**1.4**	**3**	**1.6**	**1.6**

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
407	18EIL47	EMBEDDED CONTROLLERS LAB

Course outcomes of Embedded Controllers Lab (18EIL47)

Course Name : C407	Year: 2018-22
	At the end of the course, the students are able to
C407.1	Get hands-on exposure in 8051 and MSB 430 platform.
C407.2	Enhance programming skills using Assembly language and C.
C407.3	Design and interfacing of microcontroller based embedded systems.
C407.4	Build projects

CO-PO mapping (Correlation Mapping)

Course Name: C407															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C407.1	3	1	1	1	2							2	1	1	1
C407.2	3	2	2	2	2							2	1	2	1
C407.3	3	3	2	3	2							3	2	1	2
C407.4	3	3	2	3	2							2	2	2	1
C407 (Avg.)	3.0	2.3	1.8	2.3	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	1.5	1.5	1.3

Course outcome Attainment:

Course outcome Attainment of Embedded Controllers Lab (18EIL47)								Year: 2018-22
Course Name	CO1		CO2		CO3		CO4	
	%	Level	%	Level	%	Level	%	Level
C407								

Course outcome Attainment of Embedded Controllers Lab (18EIL47)						Final attainment level
Course Name	CIE*				SEE	
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C407							

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.75	1
60-75	2	5.76-6.75	2
75 above	3	6.75 & above	3

Final PO Attainment

PO Attainment of Embedded Controllers Lab (18EIL47)															Year: 2018-22
Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS 02	PS03
C407	3.0	2.3	1.8	2.3	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	1.5	1.5	1.3

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
505	18EI53	Process Control Systems (18EI53)

Course outcomes of Process Control Systems (18EI53)

Course Name : C503	Year: 2018-22
	At the end of the course, the students are able to
C503.1	Apply the principles of process control, in process evaluation, data representation and the elements of final control operation.
C503.2	Analyse the principle and working of continuous and discontinuous controller modes.
C503.3	Design analog controllers using op-amps. Digital controllers for the given specifications and develop software program for implementing controller modes,
C503.4	Analyse control loop characteristics, process loop tuning, and assess the quality, able to identify instrumentation symbols.
C503.5	Explain the concepts and applications of modelling and simulation of process plant inclusive of multivariable and intelligent controllers.

CO-PO mapping (Correlation Mapping)

Course Name: C503															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C503.1	3	3	2									3	3	2	2
C503.2	3	3	3									2	3	3	3
C503.3	3	3	3	2								3	3	3	2
C503.4	3	3	3	2								3	3	3	2
C503.5	3	2	2									1	2	2	2
C503 (Avg.)	3.0	2.8	2.6	2.0								2.4	2.8	2.6	2.2

Course outcome Attainment:

Course outcome Attainment of Process Control Systems (15EI53)										Year: 2018-22
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C503	94	3	94	3	100	3	100	3	74	2

Course outcome Attainment of Process Control Systems (15EI53)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C503	92	3	98	3	83	3	3

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of Process Control Systems (18EI53)															Year: 2018-22
Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS 02	PS03
C503	3.0	2.8	2.6	2.0								2.4	2.8	2.6	2.2

CO-PO Correlation Mapping and Justification

Subject with Code: Process Control Systems (18EI53)

COs-POs / PSOs Mapping		Level	Justification
CO1	PO1	3	Laws of physics and mathematical representation of the devices and transfer functions, engineering fundamentals in understanding process and its characteristic's.
	PO2	3	Analysing the closed loop process control systems and assess the performance, using different techniques.
	PO3	2	Designing basic closed loop control systems to provide control of the interested dynamic variable for the given specifications, however design strategies for complex systems not covered in this course outcome.
	PO12	3	Basics of the process behaviour and control systems enables to apply in learning advanced applications and complex sub systems and systems.
	PSO1	3	Knowledge related to fundamentals related to elements of the process and its behaviour with respect to regulating dynamic variable, including DDC and networking of process is dealt.
	PSO2	2	Design and development of process control systems requires understanding the underlaying aspects of the process is exercised, Advanced aspects of control is taught in this course outcome.
	PSO3	2	An overview of the process and its characteristics, present control strategies taught which enable to apply knowledge in other engineering fields.
CO2	PO1	3	Mathematical relationship input and output of the controllers (Discontinuous controller modes: Two position, multiposition, floating control modes. Continuous controller modes: Proportional (P), Integral (I), Derivative (D) control modes, Composite controller modes: PI, PD, PID modes)
	PO2	3	Conceptual understanding of the controllers, response of the controllers with respect to input and outputs, behaviour of the controllers with dynamic errors.
	PO3	3	Design of controllers and conceptual understanding along with mathematical equations helps in design and development of the controllers.
	PO12	2	Concepts of controllers helps in understanding complex designs.
	PSO1	3	Basic knowledge about process, inputs, expected output related mathematical equations.
	PSO2	3	Skillset related to designing and development and response of controllers imparted.
	PSO3	3	The imparted knowledge about controllers to control different industrial process helps to migrate and adapt to changing technologies.

CO3	**PO1**	**3**	Mathematical aspects and laws of physics applied in understanding process I/O characteristics and design of analog and digital controllers.
	PO2	**3**	Identify process variables and choosing controlling variable to control the controlled variable.
	PO3	**3**	The complete strategies to design analog and digital controllers for the given specifications.
	PO4	**2**	Designing of analog and digital controllers for the given specifications
	PO12	**3**	Knowledge imparted in design and development of the controllers such that its made useful in learning advanced aspects.
	PSO1	**2**	fundamental concepts related to design of controllers for regulating process physical variables.
	PSO2	**3**	Complete design and development of automatic control system for the given specifications in the in both analog and digital domain.
	PSO3	**2**	Knowledge imparted enables to analyse and apply control strategies, but predictive techniques with analysing statistical parameters to be considered.
CO4	**PO1**	**3**	laws of physics w.r.t dynamic variables of a process. Apply the mathematical formulae, empirical formulas related to loop tuning and asses the quality of regulation.
	PO2	**3**	Analyse the process and its dynamic variables in obtaining the solution to regulate the process controlled variables.
	PO3	**3**	Developing solutions to self-regulating and non-self-regulating process and assess the quality of control systems.
	PO4	**2**	Applying strategies to tune the process loop based on the given data specifications
	PO12	**3**	Knowledge imparted in obtaining solutions to regulate industrial process enable to apply in advanced control systems.
	PSO1	**3**	Knowledge imparted and the exercise related in finding solution to regulate the dynamic variable of a process.
	PSO2	**3**	Skills related to loop tuning and analyse the quality by using measures and techniques.
	PSO3	**2**	Techniques in developing solutions to bring regulation in industrial process, one can apply in diversified fields of engineering, Predictive techniques is the state-of-art
CO5	**PO1**	3	Mathematical modeling of the process systems and simulation aspects and advanced control strategies discussed.
	PO2	2	Though mathematical aspects and algorithms related to system modeling and simulation an overview is given detail discussion on algorithms AI/ML is the requirement.
	PO3	2	In depth analysis and simulation by applying statistically related aspects related to control the variables of a process is required.

	PO12	1	Only a brief overview of all the advanced control techniques/ strategies discussed.
	PSO1	2	The particular course outcome only confined to knowing modeling and simulation aspects with handful of examples.
	PSO2	**2**	Basics skills in developing the control strategies as applied to considering statistical parameters is imparted.
	PSO3	**1**	Basic fundamentals related to predictive analysis and control of process dynamic variables discussed, advanced techniques in applying predictive analysis in bringing regulation of the variables requires developing programs using AI/ML.

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
504	18EI54	BioMedical Instrumentation

Course outcomes of BioMedical Instrumentation

Course Name : C504	Year: 2018-22
C504.1	Elucidate the origin of bio-electric signals, types of bio-signals and their measurement
C504.2	Describe the cardiac, brain and muscular physiological systems with the related diagnostic measurement methods.
C504.3	Recognize the therapeutic methods of treatment and the associated instrumentation
C504.4	Identify and judge patient safety issues related to biomedical instrumentation.
C504.5	Describe the principle and working of cardiac pacemakers, defibrillators, BP measurement, blood flow meters, CO measurement, respiration measurements and their implementation

CO-PO mapping (Correlation Mapping)

Course Name: C504												Year: 2018-22			
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C504.1	3	1	1									2	3	1	3
C504.2	3	1	1									2	3	1	3
C504.3	3	1	1									2	3	1	3
C504.4	3	1	1									2	3	1	3
C501.5	3	1	1									2	3	1	3
C504 (Avg.)	3	1	1									2	3	1	3

Course outcome Attainment:

Course outcome Attainment of BioMedical Instrumentation (18EI54) Year: 2018-22										
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C504										

Course outcome Attainment of BioMedical Instrumentation (18EI54)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C504							

CIE targets	SEE targets

Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of BioMedical Instrumentation (18EI54) Year: 2018-22															
Course Name	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS 02**	**PS03**
C504															

BioMedical Instrumentation (18EI54) **Year: 2018-22**

ACTION/CONTINUOUS IMPROVEMENT PLANNED/ JUSTIFICATION

Action:

Improvement:

Justification for BioMedical Instrumentation (18EI54) year: 2018-22

CO/PO	CORRELATION	JUSTIFICATION
CO1-PO1	**3**	
CO2-PO2	**2**	
CO3-PO3	**1**	

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME	Faculty
505	18EI55	LASERS AND OPTICAL INSTRUMENTATION	AP

Course outcomes of LASERS AND OPTICAL INSTRUMENTATION

Course Name : C505	**Year: 2018-22**
C505.1	Explain the principle and working of Laser systems
C505.2	Discuss the engineering applications of laser systems
C505.3	Apply fiber optic laser systems in medical field
C505.4	Discuss the fundamentals of optical fiber communications
C505.5	Evaluate the design of optical fibers
C505.6	Design the laser output modifications to facilitate engineering of laser systems.

CO-PO mapping (Correlation Mapping)

Course Name: C505														**Year: 2018-22**	
COURSE OUTCOMES	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS O2**	**PS O3**
C505.1	3	3	3	1								3	3		2
C505.2	3	3	3	1		1						3	3		2
C505.3	3	3	3	1		1						3	3		3
C505.4	3	3	3	1								3	3		3
C505.5	3	3	3	1		1	3	2				3	3		3
C505.6	3	3	3	1								1	3		1
C505 (Avg.)	**3**	**3**	**3**	**1**	**0**	**1**	**3**	**2**	**0**	**0**	**0**	**2.7**	**3**	**0**	**2.3**

Course outcome Attainment:

Course outcome Attainment of LOI **(18EI55)**												**Year: 2018-22**
Course Name	**CO1**		**CO2**		**CO3**		**CO4**		**CO5**			
	%	**Level**	**%**	**Level**	**%**	**Level**	**%**	**Level**	**%**	**Level**	**%**	**Level**
C505												

Course outcome Attainment of LOI **(18EI55)**							**Final attainment level**
Course Name	**CIE***				**SEE**		
	CO(%)	**Level (X1)**	**Q&A(%)**	**Level (X2)**	**SEE%**	**Level (X3)**	
C505							

CIE targets		**SEE targets**		
Below 45	0	0-4	<45	0
45-60	1	4.01-5.99	45-55	1
60-75	2	6.00-6.99	55-65	2
75 above	3	7 & above	65&above	3

Final PO Attainment

PO Attainment of LOI (18EI55)														**Year: 2018-22**	
Course	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PS02**	**PS03**
C505															

Justification:

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
2. Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations
4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice – **laser safety**
7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development **- Usage of fiber optic imaging in medicine, industrial automation**
8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice – **Usage of fiber optic imaging in medicine, industrial automation**

Program Specific Outcomes (PSOs)

Instrumentation Engineers are able to:

1. Domain Knowledge: relate the fundamental concepts of Instrumentation (measurement, control, operation, monitoring and maintenance) to varied measurement systems and models.
2. Skill Set: design and develop automatic control system for the given specifications in the allied fields of engineering.
3. Adaptability: adapt and migrate to changing interdisciplinary technologies to provide improvised solutions.

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
506	18EI56	**VLSI Design**

Course outcomes of VLSI Design

Course Name : C506	Year: 2018-22
C506.1	Identify the CMOS layout levels, and the design layers used in the process sequence.
C506.2	Describe the general steps required for processing of CMOS integrated circuits.
C506.3	Design static CMOS combinational and sequential logic at the transistor level.
C506.4	Demonstrate different logic styles such as complementary CMOS logic, pass-transistor Logic, dynamic logic, etc.
C506.5	Interpret the need for testability and testing methods in VLSI.

CO-PO mapping (Correlation Mapping)

Course Name: C506												Year: 2018-22			
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C506.1	3	1										2	1	2	1
C506.2	3	3	1	2								2	1	1	1
C506.3	3	1	3	3	1							2	1	1	1
C506.4	2	2	1	2								2	1	2	2
C506.5	3	1	1	1								2	1	1	2
C506 (Avg.)	2.2	1.8	2.3	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	1.0	1.4	1.4

Course outcome Attainment:

Course outcome Attainment of VLSI Design (18E56)										Year: 2018-22
	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C506										

Course outcome Attainment of VLSI Design (18EI56)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C506							

CIE targets		SEE targets		
Below 45	0	0-4	<45	0
45-60	1	4.01-5.99	45-60	1
60-75	2	6.00-6.99	60-70	2
75 above	3	7 & above	70&above	3

Final PO Attainment

PO Attainment of VLSI Design (18EI56)														Year: 2018-22
Course Name	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS 02**	**PS03**
C505															

VLSI Design (18EI56) **Year: 2018-22**

ACTION/CONTINUOUS IMPROVEMENT PLANNED/ JUSTIFICATION

Action:

Improvement:

Mapping		Mapping Levels: (Low / Medium / High)	Justification
CO1	PO1	3	Acquire the knowledge on IC Techno1ogy
	PO2	1	Analysis of different types of IC fabrication methods.
	PO12	2	CMOS integrated circuits design technologies undergo wide technology changes. Extensive knowledge of the IC designs will make the student adaptable to the technological changes.
	PSO1	1	Solve problems to different CMOS layout levels by applying acquired knowledge.
	PSO2	2	Examine the relation between layout levels & design layers
	PSO3	2	Implement the basics of CMOS Layers in higher learning
CO2	PO1	3	Acquire knowledge on fundamental concepts of CMOS IC Processing steps. Understand its requirements. Learn the basics

			of CMOS IC technology.
	PO2	1	Analyze various fabrication methods.
	PO3	2	Project elucidations to problems faced during IC design.
	PO4	2	Solutions to problems in VLSI Processing.
	PO12	2	Knowledge of IC Design Era.
	PSO1	1	Analyse and design VLSI Deign processing methods
	PSO2	2	Apply efficient and optimised techniques in IC fabrication.
	PSO3	1	Develop schematic circuits for various combinational circuits
CO3	PO1	3	Acquire the knowledge on fundamental concepts of transistor level design requirements.
	PO2	1	Analysis of various configurations of combinational and Sequesntial circuits.
	PO3	3	Design solutions to problems using knowledge of nMOS & CMOS design technologies.
	PO4	3	Use the knowledge of technologies for developing solutions to complex combinational circuit problems
	PO12	2	Recognize the combinational & sequential circuits with logic design.
	PSO1	1	Solve problems to develop various ciruits by using pass transistors & transmission gates.
	PSO2	2	Examine the designs by Layout design rule checks
	PSO3	1	Implement the concepts of logical designs.
CO4	PO1	2	Knowledge of layer information &Stick diagrams are acquired.
	PO2	2	Understand and analyze the working of pass transistor Logic
	PO4	1	Use the knowledge of color codes to solve complex problems in CMOS & nMOS technologies.
	PO12	2	Apply the knowledge in recent trends in design of logics by using miniaturized design.
	PSO1	1	Interpretations of the systems are done with the acquired knowledge.
	PSO3	2	Different performance characteristics has to be analyzed for designing of circuits by using pass transistors, transmission gates & dynamic logic.
CO5	PO1	3	Acquire the knowledge of VLSI Design for testablility.
	PO2	1	Various testing methods in VLSI are analyzed with respect to changing parameters to produce engineering solutions
	PO3	1	Design a solution for given application using suitable for testability.
	PO4	1	Use the knowledge of VLSI testing principles to solve complex problems.
	PO12	2	Knowledge of Design Process-Computational Elements for complex engineering problems can be analyzed and interpreted.
	PSO1	1	Interpretations of the systems are done with the acquired knowledge.
	PSO2	1	Different performance characteristics has to be analyzed and

			utilized for by using CAD tools for design and simulation
	PSO3	2	Knowledge of practical aspects and testability is required to develop error free real time systems.

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
508	18EIL58	DIGITAL SIGNAL PROCESSING LAB

Course outcomes of DIGITAL SIGNAL PROCESSING LAB

Course Name : C508	Year: 2018-22
C508.1	Apply the concept of sampling an analog signal, and use it for real time applications
C508.2	Appreciate the concepts of convolution, correlation and apply it to solve practical problems
C508.3	Generate and compute discrete signals, apply FFT/DFT concepts to determine spectrum of a given signal
C508.4	Apply the basic filter concepts, design and evaluate different types of low pass and high pass filters.
C508.5	Design and demonstrate the DSP concepts, IIR and FIR filters using Matlab / Scilab/Octave programs and DSP Kit.

CO-PO mapping (Correlation Mapping)

Course Name: C508												Year: 2018-22			
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C508.1	3	3	3	2	2							2	3	1	2
C508.2	3	3	3	2	2							2	3	1	2
C508.3	3	3	3	2	2							2	3	1	2
C508.4	3	3	3	2	2							2	3	1	2
C508.5	3	3	3	2	3							2	3	1	2
C508 (Avg.)	3	3	3	2	2.2							2	3	1	2

Course outcome Attainment:

Course outcome Attainment of DIGITAL SIGNAL PROCESSING LAB (18EIL58) Year: 2018-22

Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C508	100	3	100	3	100	3	100	3	100	3

Course outcome Attainment of DIGITAL SIGNAL PROCESSING LAB (18EIL58)

Course Name	CIE*				SEE		Final attainment level
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C508	100	3			100	3	3

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of DIGITAL SIGNAL PROCESSING LAB (18EIL58)												Year: 2018-22		
Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS 02	PS03
C508	3	3	3	2	2.2							2	3	1	2

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
601	18EI61	Analog and Digital Communication Systems

Course outcomes of Analog and Digital Communication Systems

Course Name : C601	Year: 2018-22
C601.1	Analyse simple system for generation and detection of AM, DSB, SSB and VSB signals.
C601.2	Describe the concepts and performance of frequency modulation schemes.
C601.3	Explain the concepts of sampling theorem, and pulse modulation and demodulation techniques.
C601.4	Analyse systems for generation and detection of digital modulation systems and assess its performance.
C601.5	Describe the operation of WPAN technologies, protocols and cellular networks.

CO-PO mapping (Correlation Mapping)

Course Name: C601															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C601.1	3	3	2		2							2	3	2	3
C601.2	3	3	2		2							2	2	2	2
C601.3	3	3	2		2							3	2	2	2
C601.4	3	3	1		1							2	2	2	1
C601.5	3	2	1									2	2	2	1
C601 (Avg.)	3.0	2.8	1.6		1.4							2.2	2.2	2.0	1.8

Course outcome Attainment:

Course outcome Attainment of Analog and Digital Communication Systems (18EI61) Year: 2018-22										
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C601	100	3	100	3	100	3	100	3	100	3

Course outcome Attainment of Analog and Digital Communication Systems (18EI61)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	

C601	100	3	100	3	78	3	3

CIE targets		**SEE targets**	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of Analog and Digital Communication Systems (18EI61) Year: 2018-22														
Course Name	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS 02**	**PS03**
C601	**3.0**	**2.8**	**1.6**		**1.4**							**2.2**	**2.2**	**2.0**	**1.8**

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
643	18EI643	OPERATING SYSTEMS

Course outcomes of OPERATING SYSTEMS

Course Name : C643	**Year: 2018-22**
C643.1	Describe basic structure and functioning of OS and explain organization of computer system, and components, computing environments, network architectures, protocols and security & typical structure of OS.
C643.2	Analyze the process management, process scheduling, threads their issues and cpu scheduling algorithms
C643.3	Describe the concepts of process synchronization and analyze the problems of synchronization. Evaluate the cause and effect related to deadlocks, prevention and avoidance of the deadlocks
C643.4	Describe the techniques of memory management, virtual memory concepts, allocation and paging
C643.5	Apply appropriate disk scheduling algorithms. Describe the interfaces to file systems, file structure and implement file systems and directory structure

CO-PO mapping (Correlation Mapping)

Course Name: C643												**Year: 2018-22**			
COURSE OUTCOMES	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS O2**	**PS O3**
C643.1	3	2	1	1								2	2	1	2
C643.2	3	2	2	2								3	2	2	3
C643.3	3	2	2	2								3	2	2	3
C643.4	3	2	2	1								3	2	1	3
C643.5	3	2	2	2								2	2	1	2
C643 (Avg.)	3	2	1.8	1.6								2.6	2	1.4	2.6

Course outcome Attainment:Course outcome Attainment of OPERATING SYSTEMS (18EI643) Year: 2018-22

Course Name	**CO1**		**CO2**		**CO3**		**CO4**		**CO5**	
	%	**Level**	**%**	**Level**	**%**	**Level**	**%**	**Level**	**%**	**Level**
C643	100	3	100	3	100	3	100	3	100	3

Course outcome Attainment of OPERATING SYSTEMS (18EI643)							**Final attainment level**
Course Name	**CIE***				**SEE**		
	CO(%)	**Level (X1)**	**Q&A(%)**	**Level (X2)**	**SEE%**	**Level (X3)**	
C643	100	3	100	3	82.5	3	3

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of OPERATING SYSTEMS (18EI643)												Year: 2018-22			
Course Name	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS 02**	**PS03**
C643	3	2	1.8	1.6								2.6	2	1.4	2.6

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
501	18EI71	Automation in Process Control

Course outcomes of Automation in Process Control

Course Name : C701	Year: 2018-22
C701.1	Describe architecture, functioning and applications of PLC in automation and recognize various I/O modules of PLC.
C701.2	Apply programming concepts to interface peripherals and write ladder diagram program using different PLC instruction sets.
C701.3	Design Design and analyse the ladder diagram program using different PLC instruction sets for timer and counter modules.
C701.4	Discuss the various distributed control system and its architecture to develop an automation system.
C701.5	Analyse the basics of SCADA and communication protocols used in automation industries.

CO-PO mapping (Correlation Mapping)

Course Name: C505															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C701.1	3	3	2	2	3							3	3	2	3
C701.2	2	3	2	2	2							2	2	1	3
C701.3	3	2	3	2	2							3	3	2	2
C701.4	2	3	2	2	2							3	2	1	2
C701.5	3	2	2	2	2							3	3	1	3
C701 (Avg.)	2.6	2.6	2.2	2.0	2.2	0	0	0	0	0	0	2.8	2.6	1.4	2.6

Course outcome Attainment:

Course outcome Attainment of Automation in Process Control (18EI45)										Year: 2018-22
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C505										

Course outcome Attainment of Automation in Process Control (18EI45)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C505							

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of Automation in Process Control (18EI45) Year: 2018-22															
Course Name	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS 02**	**PS03**
C505															

Aeronautical Instrumentation (15EI552) **Year: 2015-19**

ACTION/CONTINUOUS IMPROVEMENT PLANNED/ JUSTIFICATION

Action:

Improvement:

Justification for Aeronautical Instrumentation (15EI552) year: 2015-19

CO/PO	CORRELATION	JUSTIFICATION
CO1-PO1	**3**	
CO2-PO2	**2**	
CO3-PO3	**1**	

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
702	18EI72	ARM PROCESSOR

Course outcomes of ARM Processor

Course Name: C702	Year: 2018-22
C702.1	Depict the organization, architecture, bus technology, memory and operation of the ARM processors
C702.2	Employ the knowledge of Instruction set of ARM processors to develop basic Assembly Language Programs
C702.3	Recognize the importance of the Thumb mode of operation of ARM processor and develop C programs for ARM processors
C702.4	Describe the techniques involved in Exception and Interrupt handling in ARM Processors and understand the fundamental concepts of Embedded Operating Systems
C702.5	Analyse the working of memory and memory management system to aid real time operating system.

CO-PO mapping (Correlation Mapping)

Course Name: C702															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C702.1	3	3	3	2	2							3	3	3	3
C702.2	3	3	3	2	2							3	2	3	3
C702.3	3	3	3	2	2							3	3	3	3
C702.4	3	2	3	2	2							3		3	3
C702.5	3	2	3									2		2	2
C702 (Avg.)	3.0	2.6	3.0	2.0	2.0							2.8	2.7	2.8	2.8

Course outcome Attainment:

Course outcome ARM PROCESSOR (18EI72)										Year: 2018-22
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C702	64	2	60	1	62	2	76	3	64	2

Course outcome Attainment of ARM PROCESSOR (18EI72)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C702	65	2	100	3	66.28	2	2

CIE targets		SEE targets		
Below 45	0	0-4	0	
45-60	1	4.01-5.99	1	
60-75	2	6.00-6.99	2	
75 above	3	7 & above	3	

Final PO Attainment

PO Attainment of ARM PROCESSOR (18EI72)											Year: 2018-22			
Course Name	**PO1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS0 2**	**PS03**
C702	2	1.73	2	1.33	1.33							1.86	1.8	1.86	1.86

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved, **VTU** Affiliated and **NAAC 'A'** Accredited)
(**UG programs** – CSE, ECE, ISE, EIE and EEE have been **Accredited** by **NBA** for the *Academic Years 2018-19, 2019-20, 2020-21 & 2021 -22*)
Channasandra, Dr. Vishnuvardhan Road, Bengaluru - 560 098

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
704	18EI744	Internet of Things

Course outcomes of Internet of Things

Course Name: C704	Year: 2018-22
C704.1	Interpret the impact and challenges posed by IoT networks leading to new architectural models.
C704.2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.
C704.3	Appraise the role of IoT protocols for efficient network communication.
C704.4	Elaborate the need for security in IoT.
C704.5	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in industry.

CO-PO mapping (Correlation Mapping)

Course Name: C704															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C704.1	3	3	3	2	2							3	3	3	3
C704.2	3	3	3	2	2							3	2	3	3
C704.3	3	3	3	2	2							3	3	3	3
C704.4	3	3	2	2	2	1		2				3	3	3	3
C704.5	3	3	3	2		2	2	1	1	1		3	3	2	2
C704 (Avg.)	3.0	3.0	2.8	2.0	2.0	1.5	2	1.5	1	1		3.0	2.8	2.8	2.8

Course Outcome Attainment:

Course outcome Internet of Things (18EI744)									Year: 2018-22	
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C704										

Course outcome Attainment of Internet of Things (18EI744)							Final attainment level
Course Name	CIE*				SEE		
	CO (%)	Level (X1)	Q&A (%)	Level (X2)	SEE%	Level (X3)	
C704							

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of Internet of Things (18EI744)										Year: 2018-22					
Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS 02	PS0 3
C704															

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
501	18EI81	Neural Networks and Fuzzy Logic System

Course outcomes of Neural Networks and Fuzzy Logic System

Course Name : C801	Year: 2018-22
C801.1	Discuss the single layer, multilayer network architecture and understanding the differences between biological neural network and ANN
C801.2	Analyze the ANN for pattern classification and learning algorithms
C801.3	Develop and configure ANNs with different types of learning algorithms for real world problems
C801.4	Discuss the fundamentals of fuzzy logic, implementation and their functions
C801.5	Apply fuzzy logic concepts in building automated control systems..
C801.5	Discuss the single layer, multilayer network architecture and understanding the differences between biological neural network and ANN

CO-PO mapping (Correlation Mapping)

Course Name: C505															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C801.1	3	3	3	2	2	1						3	1	2	3
C801.2	2	3	3	2	2	1						2	2	2	2
C801.3	2	2	2	3	2	1						3	1	3	3
C801.4	3	3	2	3	3	1						3	1	3	2
C801.5	3	2	3	3	2	1						3	1	2	2
C801 (Avg.)	2.6	2.6	2.6	2.6	2.2	1.0						2.8	1.2	2.4	2.4

Course outcome Attainment:

Course outcome Attainment of Neural Networks and Fuzzy Logic System (18EI81)Year: 2018-22										
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C801										

Course outcome Attainment of Neural Networks and Fuzzy Logic System (18EI81							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C801							

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of Neural Networks and Fuzzy Logic System (18EI81) Year: 2018-22															
Course Name	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS 02**	**PS03**
C505															

Aeronautical Instrumentation (15EI552) **Year: 2015-19**

ACTION/CONTINUOUS IMPROVEMENT PLANNED/ JUSTIFICATION

Action:

Improvement:

Justification for Aeronautical Instrumentation (15EI552) year: 2015-19

CO/PO	CORRELATION	JUSTIFICATION
CO1-PO1	**3**	
CO2-PO2	**2**	
CO3-PO3	**1**	

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
822	18EI822	Industrial Process Instrumentation

Course outcomes of Industrial Process Instrumentation (18EI822)

Course Name : C822	Year: 2018-22
	At the end of the course, the students are able to
C822.1	Sketch the typical instrumentation and control strategy in the process industries like paper, pulp, cement, power and steel plants.
C822.2	List the variable to be monitored and controlled in the above said process industries.
C822.3	Describe the instrumentation, control requirements and complete functioning of the above said industries.
C822.4	Analyze the hardware and software tools required for the above said process industries.
C822.5	Design and develop instrumentation and control strategy for simple process industry

CO-PO mapping (Correlation Mapping)

Course Name : Industrial Process Instrumentation (18EI822)															
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C822.1	3	3	1	2				2				3	3	1	2
C822.2	3	3	1	1				2				3	3	1	2
C822.3	3	3	1	1				3				3	3	1	2
C822.4	3	3	1	1				3				3	3	1	2
C822.5	3	3	2	1				3				3	3	1	2
C822 (Avg.)	3.0	3.0	1.2	1.2	0.0	0.0	0.0	2.6	0.0	0.0	0.0	3.0	3.0	1.0	2.0

Course outcome Attainment:

Course outcome Attainment of Industrial Process Instrumentation (18EI822)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C832							

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.75	1
60-75	2	5.76-6.75	2
75 above	3	6.75 & above	3

Final PO Attainment

PO Attainment of Industrial Process Instrumentation (18EI822) Year: 2018-22															
Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PS02	PS03
C832	3.0	3.0	1.2	1.2	0.0	0.0	0.0	2.6	0.0	0.0	0.0	3.0	3.0	1.0	2.0

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
601	18EIS84	Technical Seminar

Course outcomes of Technical Seminar

Course Name : C804	Year: 2018-22
C804.1	Develop knowledge in the field of Electronics & Instrumentation Engineering and other disciplines through independent learning and collaborative study.
C804.2	Identify and discuss the current, real-time issues and challenges in engineering & technology.
C804.3	Develop written and oral communication skills.
C804.4	Explore concepts in larger diverse social and academic contexts.
C804.5	Apply principles of ethics and develop the skills to enable life-long learning.

CO-PO mapping (Correlation Mapping)

Course Name: C804															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C804.1	3	2	1					1	2	3		3	2	2	3
C804.2	3	2	2					1	2	3		3	2	2	3
C804.3	3	2	1					1	2	3		3	2	1	2
C804.4	3	1	1					1	2	3		3	2	1	2
C804.5	3	2	2					1	2	1		3	2	2	3
C804 (Avg.)	3	1.8	1.4					1	2	2.6		3	2	1.6	2.6

Course outcome Attainment:

Course outcome Attainment of Technical Seminar (18EIS804)										Year: 2018-22
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C804										

Course outcome Attainment of Technical Seminar (18EIS84)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C804							

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of Technical Seminar (18EIS84) Year: 2018-22														
Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS 02	PS03
C804															

Technical Seminar (18EIS84) **Year: 2018-22**

ACTION/CONTINUOUS IMPROVEMENT PLANNED/ JUSTIFICATION

Action:

Improvement:

Justification for Technical Seminar (18EIS84) year: 2018-22

CO/PO	CORRELATION	JUSTIFICATION
CO1-PO1	3	
CO2-PO2	2	
CO3-PO3	1	

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
501	18EI85	Internship / Professional Practice

Course outcomes of Internship / Professional Practice

Course Name : C101	Year: 2018-22
C805.1	Apply knowledge and skills learnt to acquire practical experience within industry in which the internship is done.
C805.2	Experience the activities, functions of professionals and develop oral and written communication skills.
C805.3	Recognize the areas for future knowledge and skill development.
C805.4	Acquire the basic knowledge of administration, marketing, finance and economics.
C805.5	Develop the skills to enable lifelong learning.

CO-PO mapping (Correlation Mapping)

Course Name: C805															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C805.1	3	3	3	3	3			3	2	2	1	3	3	3	3
C805.2	3	2	1						3	3	3	3	1	1	3
C805.3	3	3	2	3	3			2		3	3	3	1	3	2
C805.4				2		2	1	3	3	3	3	3	1	2	3
C805.5	3	3	2	3	3			3	3	3	3	3	3	3	3
C505 (Avg.)	3.0	2.8	2.0	2.8	3.0	2.0	1.0	2.8	3.3	2.8	2.6	3.0	1.8	2.4	2.8

Course outcome Attainment:

Course outcome Attainment of Internship / Professional Practice (18EI85)										Year: 2018-22
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C505										

Course outcome Attainment of Internship / Professional Practice (18EI85)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C505							

CIE targets		SEE targets	
Below 45	0	0-4	0

45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of Internship / Professional Practice (18EI85) Year: 2018-22															
Course Name	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS 02**	**PS03**
C505															

Aeronautical Instrumentation (15EI552) **Year: 2015-19**

ACTION/CONTINUOUS IMPROVEMENT PLANNED/ JUSTIFICATION

Action:

Improvement:

Justification for Aeronautical Instrumentation (15EI552) year: 2015-19

CO/PO	CORRELATION	JUSTIFICATION
CO1-PO1	**3**	
CO2-PO2	**2**	
CO3-PO3	**1**	

Department of EIE

Staff: MADHURA G (Batch: 2016 - 2020)

C No	SUBJECT CODE	SUBJECT NAME
303	15EI33	ANALOG ELECTRONIC CIRCUITS

Course outcomes of ANALOG ELECTRONIC CIRCUITS (15EI33)

Course Name: C303	Year: 2016-20
	At the end of the course, the students are able to
C303.1	Apply the engineering knowledge to design and develop amplifier circuits using BJTs and FETs and analyse hybrid models for various biasing circuits
C303.2	Demonstrate the modelling of BJT/FET, perform small signal ac analysis and design BJT/FET amplifier networks.
C303.3	Examine the frequency response and to discuss the effects of circuit capacitances and parasitic capacitances on the response of single stage and multistage BJT/FET amplifiers
C303.4	Design, describe the operation and compare the power efficiency of various classes of Power amplifier circuits.
C303.5	Discuss the types of Feedback and their effects on Amplifier and Oscillator circuits.

Course Name: C303											**Year of study: 2018-2019**				
Course Outcomes	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**	**PSO3**
C303.1	3	3	3	1					1		2	2	3	3	2
C303.2	3	3	3	1					1		2	2	3	3	2
C303.3	3	3	3	1					1		2	2	3	3	2
C303.4	3	3	3	1					1		2	2	3	3	2
C303.5	3	3	3	1					1		2	2	3	3	2
C303	**3**	**3**	**3**	**1**					**1**		**2**	**2**	**3**	**3**	**2**

COs Mapping	POs Mapping	Level	Justification
CO1	PO1	2	Acquire the knowledge on different methods of measurement, instruments and understand the basic concepts of transducers and its applications.
	PO2	2	Discuss the basic concepts to identify the input output configuration of an instruments and measurement systems
	PO12	3	Instruments and measurement systems undergo wide technology changes. Extensive knowledge of the basic instruments and measurement systems will make the student adaptable to the technological changes.
	PSO1	2	Able to Identify functional characteristics of various Instruments and formulate and development of solution approach for to varied measurement systems and models.
	PSO2	3	Ability to identify procedures and components in relevant field will help to describe working principles of different Instruments.
	PSO3	3	Implement the basics of measurement systems and instruments in higher learning
CO2	PO1	3	Acquire the knowledge of static and dynamic characteristics of an Instrument.
	PO2	2	Analyses of time domain and frequency domain response for different type of inputs.
	PO3	2	Design solutions to complex problems using knowledge of time domain analysis and frequency domain analysis
	PO12	2	Recognize the response of different type of input applied to first order systems in time domain and frequency domain.

	PSO1	3	Knowledge of static and Dynamic characteristics of an Instrument and also Factors influencing the choice of transducers/instruments.
	PSO2	2	Different performance characteristics has to be analysed and utilized for varying parameters
	PSO3	3	Implement the basics of performance characteristics of an instruments in higher learning and latest technologies.
CO3	**PO1**	**3**	Acquire the knowledge of various sensors used for measurement of Displacement.
	PO2	**1**	Analyse the design and working principles of Displacement and Level sensors to adopting to the latest measurement systems.
	PO12	**2**	Apply the knowledge in designing the sensors for specific applications.
	PSO1	**3**	Knowledge of sensors is needed for effective solutions in the field of Instrument and Measurement systems.
	PSO2	**2**	To design and develop a displacement and level sensors for specific applications.
	PSO3	**3**	Demonstrated the functionality of sensing various parameters and adaptability to different process variables like displacement ,level etc.
CO4	**PO1**	**2**	Knowledge of fundamental key elements and concepts in understanding the working principle of different types of strain gauges.
	PO2	**2**	Analyse and compute the principal stress and principal strain for a given state of stress or strain.
	PO3	**3**	Develop solutions for stress, strain and force subjected to internal and external pressure and rotating discs.
	PO12	**2**	Recognize the need for in independent and life-long learning
	PSO1	**3**	To acquire knowledge of different instruments used for measuring stress, force and torque. To understand as to in which situation the concerned instrument has to be used.
	PSO2	**2**	Different performance characteristics has to be analysed and utilized for measurement of force.
	PSO3	**3**	Improved resistance wire strain-gauges are adaptable for various applications.
CO5	**PO1**	**3**	Fundamental knowledge of science is required for understanding the properties of various pressure sensors.
	PO2	**2**	Mathematical analysis and design of a various pressure sensor like Force balance pressure Transducer.
	PO3	**3**	Able to understand the various energies involved in a fluid flow problem and applying the Bernoulli's equation to find the total energy.
	PO12	**3**	Ability to access the technological changes that takes place in the sensors and ability to make use of it in different applications.

	PSO1	**3**	Analysis of different parameters is required to identify the procedures pertaining to various applications
	PSO2	**2**	Different performance characteristics has to be analysed and utilized for measurement of pressure.
	PSO3	**3**	The students will be able to build a strong foundation in Instrumentation for developing innovative products to meet the societal needs thereby evolving as an eminent entrepreneur.

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
304	15EI34	DIGITAL DESIGN AND HDL

Staff: Mrs. Sneha G Chachadi

Course outcomes of Digital Design and HDL (15EI34)

1. Simplify Boolean functions using K-map and Quine-McCluskey minimization technique
2. Analyze and design and combinational logic circuits. (MUX, De-MUX, adder and subtractor, and comparator circuits)
3. Analyze and design code converters, encoders and decoders.
4. Analyze and design of synchronous sequential circuits
5. Analyze and design sequential circuits, Moore/Mealy machines
6. Simulate and synthesize Verilog code in various styles

CO-PO mapping (Correlation Mapping)

Course Name: C304												Year: 2015-19			
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PSO 3
C304.1	3	3	3									1	2		
C304.2	3	3	3										2	1	1
C304.3	3	3	2									1	2	2	1
C304.4	3	3	3									1	2	1	1
C304.5	3	3	3		1							1	1	2	
C304.6	3	3	3		1							2	1	2	2
C304 (Avg.)	3	3	2.8	0	1	0	0	0	0	0	0	1.2	1.7	1.6	1.25

Transducers and Instrumentation – 15EI35

At the end of the course student will be able to-

CO PO Mapping	
CO1	Identify and use the suitable transducer for the specific application of measurement.
CO2	Apply suitable noise removal technique in the design of measuring instruments.
CO3	Interpret and analyse the static and dynamic characteristics of instruments.
CO4	Apply functional aspects and use transducers for displacement and strain measurement.
CO5	Explain functional aspects, usage of different transducers for temperature, level, pressure, speed, thickness measurement.

Total Outcome															
COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	2	2								3	3	1	3
CO2	2	3	1	2								3	3	1	3
CO3	2	3	2	2								3	3	1	2
CO4	2	3	1	2								3	3	1	2
CO5	2	3	1	1								3	3	1	3
CO - PO LEVEL	**2.0**	**3.0**	**1.4**	**1.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**3.0**	**3.0**	**1.0**	**2.6**

B. E. Electronics and Instrumentation Engineering

Semester III

Digital Design and HDL Lab(15EIL38)

Course Name:C308	**Year:2019-20**
	At the end of the course, the students are able to
C308.1	Realize Boolean expression using Universal gates / basic gates using ICs and Verilog
C308.2	Demonstrate the function of adder/subtractor circuits using gates/ICs & Verilog.
C308.3	Design and analyze the Comparator, Multiplexers Decoders, Encoders circuits using ICs and Verilog.
C308.4	Design and analysis of different Flip-flops and counters using gates and FFs
C308.5	Able to use FPGA/CPLD kits for down loading Verilog codes for shift registers and counters and check output.

Course Name: C308											**Year of study: 2019-20**				
Course Outcomes	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**	**PSO3**

C308.1	3	3	2	1	2							2	2	2	2
C308.2	3	3	2	1	2							3	2	2	3
C308.3	3	2	3	2	2							3	2	2	1
C308.4	3	3	3	2	2							3	1	2	2
C308.5	3	2	2	3	3							3	1	1	2
C308	3	2.6	2.4	1.8	2.2							2.8	1.6	1.8	2.0

COs Mapping	POs Mapping	Level	Justification
CO1	PO1		
	PO2		

	PO12		
	PSO1		
	PSO2		
	PSO3		
CO2	**PO1**		
	PO2		
	PO3		
	PO12		
	PSO1		
	PSO2		
	PSO3		
CO3	**PO1**		
	PO2		
	PO12		
	PSO1		
	PSO2		
	PSO3		
CO4	**PO1**		
	PO2		
	PO3		
	PO12		

	PSO1		
	PSO2		
	PSO3		
CO5	**PO1**		
	PO2		
	PO3		
	PO12		
	PSO1		
	PSO2		
	PSO3		

Department of EIE

Staff: Dr. MADHURA G (Batch: 2016 - 2020)

C No	SUBJECT CODE	SUBJECT NAME
403	15EI43	EMBEDDED CONTROLLERS

Course outcomes of EMBEDDED CONTROLLERS (15EI43)

Course Name: C403	Year: 2016-20
	At the end of the course, the students are able to
C403.1	Depict the organization, architecture, memory organization and interfacing of the 8051 and MSP430 microcontroller. Distinguish between different architectures of microcontrollers.
C403.2	Employ the knowledge of Addressing modes and Instruction set of 8051 and MSP430 Microcontroller to develop basic Assembly Language and C Programs.
C403.3	Review the features of timers, serial communication ports in 8051 microcontroller
C403.4	Illustrate how different peripherals are interfaced to the 8051 microcontroller and develop C programs for interfacing.
C403.5	Write 8051 and MSP430 Assembly language and C programs to generate timings and waveforms, to send and receive data

Course Name: C403												**Year of study: 2018-2019**			
Course Outcomes	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**	**PSO3**
C403.1	3	3	1	1				2				3	2	3	3
C403.2	3	3	3	3	2			**2**				3	2	3	3
C403.3	3	3	3	3	2			2				3	2	3	3
C403.4	3	3	3	3	3			2				3	2	3	3
C403.5	3	3	3	3	3			2				3	2	3	3
C303	**3**	**3**	**2.6**	**2.6**	**2**			**2**				**3**	**2**	**3**	**3**

COs Mapping	POs Mapping	Level	Justification
CO1	PO1	2	Acquire the knowledge on different methods of measurement, instruments and understand the basic concepts of transducers and its applications.
	PO2	2	Discuss the basic concepts to identify the input output configuration of an instruments and measurement systems
	PO12	3	Instruments and measurement systems undergo wide technology changes. Extensive knowledge of the basic instruments and measurement systems will make the student adaptable to the technological changes.
	PSO1	2	Able to Identify functional characteristics of various Instruments and formulate and development of solution approach for to varied measurement systems and models.
	PSO2	3	Ability to identify procedures and components in relevant field will help to describe working principles of different Instruments.
	PSO3	3	Implement the basics of measurement systems and instruments in higher learning
CO2	PO1	3	Acquire the knowledge of static and dynamic characteristics of an Instrument.
	PO2	2	Analyses of time domain and frequency domain response for different type of inputs.
	PO3	2	Design solutions to complex problems using knowledge of time domain analysis and frequency domain analysis
	PO12	2	Recognize the response of different type of input applied to first order systems in time domain and frequency domain.

	PSO1	3	Knowledge of static and Dynamic characteristics of an Instrument and also Factors influencing the choice of transducers/instruments.
	PSO2	2	Different performance characteristics has to be analysed and utilized for varying parameters
	PSO3	3	Implement the basics of performance characteristics of an instruments in higher learning and latest technologies.
CO3	**PO1**	**3**	Acquire the knowledge of various sensors used for measurement of Displacement.
	PO2	**1**	Analyse the design and working principles of Displacement and Level sensors to adopting to the latest measurement systems.
	PO12	**2**	Apply the knowledge in designing the sensors for specific applications.
	PSO1	**3**	Knowledge of sensors is needed for effective solutions in the field of Instrument and Measurement systems.
	PSO2	**2**	To design and develop a displacement and level sensors for specific applications.
	PSO3	**3**	Demonstrated the functionality of sensing various parameters and adaptability to different process variables like displacement ,level etc.
CO4	**PO1**	**2**	Knowledge of fundamental key elements and concepts in understanding the working principle of different types of strain gauges.
	PO2	**2**	Analyse and compute the principal stress and principal strain for a given state of stress or strain.
	PO3	**3**	Develop solutions for stress, strain and force subjected to internal and external pressure and rotating discs.
	PO12	**2**	Recognize the need for in independent and life-long learning
	PSO1	**3**	To acquire knowledge of different instruments used for measuring stress, force and torque. To understand as to in which situation the concerned instrument has to be used.
	PSO2	**2**	Different performance characteristics has to be analysed and utilized for measurement of force.
	PSO3	**3**	Improved resistance wire strain-gauges are adaptable for various applications.
CO5	**PO1**	**3**	Fundamental knowledge of science is required for understanding the properties of various pressure sensors.
	PO2	**2**	Mathematical analysis and design of a various pressure sensor like Force balance pressure Transducer.
	PO3	**3**	Able to understand the various energies involved in a fluid flow problem and applying the Bernoulli's equation to find the total energy.
	PO12	**3**	Ability to access the technological changes that takes place in the sensors and ability to make use of it in different applications.

	PSO1	**3**	Analysis of different parameters is required to identify the procedures pertaining to various applications
	PSO2	**2**	Different performance characteristics has to be analysed and utilized for measurement of pressure.
	PSO3	**3**	The students will be able to build a strong foundation in Instrumentation for developing innovative products to meet the societal needs thereby evolving as an eminent entrepreneur.

Control Systems (15EI44)

Course Name: C404												Year of study: 2019-20			
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C404.1	3	3	3	2								2	3	3	3
C404.2	3	2	3	2								2	3	3	3
C404.3	3	3	3	2								1	2	3	3
C404.4	3	2	3	2								2	2	2	3
C404.5	3	3	3	1								1	1	1	1
C404 avg	3.0	2.6	3.0	1.8								1.6	2.2	2.4	2.6

CO-PO Correlation Mapping Justification

Subject with Code: Control Systems (15EI44)

COs-POs / PSOs Mapping		Level	Justification
CO1	PO1	3	physical system modeling and analysis requires fundamental mathematical equations, operations and laws of science
	PO2	3	physical system modeling requires analysis and synthesis, transformation, transfer function
	PO3	3	System modeling is applied diversified fields

	PO4	**2**	System modeling theoretical aspects discussed but simulation and practical implementation required
	PO12	**2**	With the basic classical control system. Advanced high level applications can be understood, example non-linear system analysis.
	PSO1	**3**	Modeling of physical systems, Transfer function application of laws of physics demands basic domain knowledge.
	PSO2	**3**	Modeling of physical systems, transfer function, breaking the complexity into simplified equations requires application of skills acquired
	PSO3	**3**	With knowledge imparted during the course period help them to adapt to various advanced engineering fields where they can contribute to organization
CO2	**PO1**	**3**	Analysis of complex interconnected block transfer functions, and reduction, synthesis.
	PO2	**2**	Very basic principles of mathematics and analysis is involved in block diagram reduction and signal flow graph.
	PO3	**3**	Design of process/ plant requires simplification of subprocess to reduce the order of the system , if required even to remove the redundant systems, Block diagram reduction and signal flow graph is helpful
	PO4	**2**	Only synthesis is considered which is their by reducing the complexity of interconnected blocks/subprocess.
	PO12	**2**	With the basic classical control system. Advanced high-level applications can be understood, example non-linear system analysis.
	PSO1	**3**	Knowledge of a process, fundamental of mathematics and laws of physics is used to obtain optimized system and modules.
	PSO2	**3**	Design and development of controller of regulating the process variable to reference value requires eliminating the delay involved and to obtain optimized model.
	PSO3	**3**	Basic knowledge imparted can be utilized to migrate to various fields of engineering.
CO3	**PO1**	**3**	Mathematical representations of all type of signals and system transfer function, the response of the systems.
	PO2	**3**	Analysing and evaluating the system response in time and frequency diamine with reference standard inputs
	PO3	**3**	Analyse the performance of the designed systems

	PO4	**2**	Designing physically realizable system that can be employed in engineering applications
	PO12	**1**	Imparting the engineering design knowledge such that they can excel in developing products, and can engage themselves in learning.
	PSO1	**2**	Basic concepts of control systems, modeling, system response, Stability, MIMO system implementation discussed with problems and solution.
	PSO2	**3**	Deriving system transfer function for complex systems and performance evaluation in terms of stability.
	PSO3	**3**	Classical control system design and development enables learner to migrate and apply the concepts in interdisciplinary technologies to provide improvised solutions.
CO4	**PO1**	**3**	Stability analysis requires mathematical skills and laws of physics to apply in design
	PO2	**2**	Identify the inputs and outputs for the system and analysing the system such that one can formulate and apply strategies to provide improvised solutions
	PO3	**3**	Finding solution to by reducing redundancy in the system, generating model for the physical system, testing system with different types of the system and assessing stability
	PO4	**2**	To control any system measurement and maintaining the interested dynamic variable of a process is essential, course involves design and interpreting the response of the system, keeping view of stability
	PO12	**2**	Basics concepts related to how to design and control the system such that it works effectively well, related knowledge is imparted which can be effectively applied in understanding advances aspects of control system independently example in MIMO system
	PSO1	**2**	Mathematical and laws of physics are applied in modeling, design and development of the system and evaluating the performance
	PSO2	**2**	System performance and its stability analysis through design is carried out.
	PSO3	**3**	Classical control system design and development enables learner to migrate and apply the concepts in interdisciplinary technologies to provide improvised solutions.
CO5	**PO1**	3	Required basics of physics and mathematical aspects to provide solutions for the MIMO systems to know stability aspects and modeling of complex systems
	PO2	3	Identifying the inputs and formulating the methods in reducing the complexity of the problem related to state space analysis.

	PO3	3	Choosing of the minimal set of state variables and reducing the complexity of the network to provide improvised solutions.
	PO4	1	Theoretical aspects related to providing solutions to problems, and applying the same to solve the problems exercised but practical hands-on to be carried out.
	PO12	1	Basics concepts related in finding solutions to MIMO systems discussed and solved problems, however advanced aspects related to state space analysis in designing of the systems and to evaluate its performance is restricted. (will be covered in advanced control systems)
	PSO1	1	Only basic mathematical aspects and choosing of state variables in finding solutions to problems exercised but advanced aspects of controllability, observability and stability and methods related is taught in advanced control systems.
	PSO2	**1**	Basics skills related to identifying the inputs ,outputs state variables and solving problems for the given mechanical system, network is analysed.
	PSO3	**1**	Only basic knowledge about finding solutions to linear systems, however nonlinear systems analysis required.

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
406	15EI46	**Scientific and Analytical Instrumentation**

Staff: Mrs. Sneha G Chachadi

At the end of the course, the students are able to

1. Get well versed with the principle, construction and working and analysis of various analytical and scientific instrumentation.
2. Impart various spectroscopic techniques and its instrumentation in various fields like medicine, Industry, etc.
3. Impart and acquire knowledge on various chromatographic methods to separate the components of any mixture.
4. Impart methods of Industrial analyzers and its application.
5. Impart knowledge on various air pollutants, their sources and their effect on nature and Human

CO-PO mapping (Correlation Mapping)

Course Name: C304														**Year: 2015-19**
COURSE OUTCOMES	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**	**PSO3**
C406.1	3	3	3							2	1			1	
C406.2	**3**	2	2							2	**3**			1	
C406.3	3	3	3						1	2	2	1	1	2	
C406.4	3	1	1						1	2	1		2	1	
C406.5	3	3	2						2	1	**2**	**1**	1		
C406 (Avg.)	**3.0**	**2.4**	**2.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1.3**	**1.8**	**1.8**	**1.0**	**1.33**	**1.25**	**0.0**

==

Course Information Sheet

Faculty **Dr. Madhura G , Dr. Mallikarjun H M**

Email madhurag@ rnsit.ac.in mallikarjun.h.m@rnsit.ac.in

Contact Number 9620555266, 9743207651

Contact Time 3 hrs/week

Class Room Embedded Controllers Lab

Program: Electronics & Instrumentation Engineering	**Degree:** B.E
Course: Embedded Controllers Lab	**Semester:** III
Course Code: 15EIL47	**Regulation / Scheme:** 2015
No. of Lecture Hours / Week: 03 **Total No. of Lecture Hours :** 42	**IA Marks:** 20 **Exam Marks:** 80
	Exam Hours: 03

Course outcomes of Embedded Controllers Lab (15EIL37)

Course Name: C407	
	At the end of the course, the students are able to
C407.1	Design and debug programs in 8051 and MSP430 based advanced software tools
C407.2	Enhance programming skills in assembly and C
C407.3	Design and interfacing of microcontroller based embedded systems
C407.4	Build Projects for instrumentation, automation and control applications

CO-PO mapping (Correlation Mapping)

Course Name: C407/ Embedded Controllers Lab (15EIL47)															
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C407.1	1	1	2	3	2						1	2	1	2	1
C407.2	2	2	3	2	2							2	1	1	1
C407.3	2	3	2	2	2			2				2	1	1	1
C407.4	2	2	2	3	2			2			1	2	1	2	1
C407 (Avg.)	**1.8**	**2.0**	**2.3**	**2.3**	**2.0**	**0.0**	**0.0**	**1.0**	**0.0**	**0.0**	**1.0**	**2.0**	**1.0**	**1.5**	**1.0**

Process Control Systems (15EI53)

Course Name: C503												Year of study: 2019-20			
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C503.1	3	3	2									3	3	2	2
C503.2	3	3	3									2	3	3	3
C503.3	3	3	3									3	2	3	2
C503.4	3	3	3									3	3	3	2
C503.5	3	2	2									1	2	2	1
C503 avg	3.0	2.8	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	2.6	2.6	2.0

CO-PO Correlation Mapping and Justification

Subject with Code: Process Control Systems (18EI53)

COs-POs / PSOs Mapping		Level	Justification
CO1	PO1	3	Laws of physics and mathematical representation of the devices and transfer functions, engineering fundamentals in understanding process and its characteristic's.
	PO2	3	Analysing the closed loop process control systems and assess the performance, using different techniques.
	PO3	2	Designing basic closed loop control systems to provide control of the interested dynamic variable for the given specifications, however design strategies for complex systems not covered in this course outcome.

	PO12	**3**	Basics of the process behaviour and control systems enables to apply in learning advanced applications and complex sub systems and systems.
	PSO1	**3**	Knowledge related to fundamentals related to elements of the process and its behaviour with respect to regulating dynamic variable, including DDC and networking of process is dealt.
	PSO2	**2**	Design and development of process control systems requires understanding the underlaying aspects of the process is exercised, Advanced aspects of control is taught in this course outcome.
	PSO3	**2**	An overview of the process and its characteristics, present control strategies taught which enable to apply knowledge in other engineering fields.
CO2	**PO1**	**3**	Mathematical relationship input and output of the controllers (Discontinuous controller modes: Two position, multiposition, floating control modes. Continuous controller modes: Proportional (P), Integral (I), Derivative (D) control modes, Composite controller modes: PI, PD, PID modes)
	PO2	**3**	Conceptual understanding of the controllers, response of the controllers with respect to input and outputs, behaviour of the controllers with dynamic errors.
	PO3	**3**	Design of controllers and conceptual understanding along with mathematical equations helps in design and development of the controllers.
	PO12	**2**	Concepts of controllers helps in understanding complex designs.
	PSO1	**3**	Basic knowledge about process, inputs, expected output related mathematical equations.
	PSO2	**3**	Skillset related to designing and development and response of controllers imparted.
	PSO3	**3**	The imparted knowledge about controllers to control different industrial process helps to migrate and adapt to changing technologies.
CO3	**PO1**	**3**	Mathematical aspects and laws of physics applied in understanding process I/O characteristic's and design of analog and digital controllers.
	PO2	**3**	Identify process variables and choosing controlling variable to control the controlled variable.
	PO3	**3**	The complete strategies to design analog and digital controllers for the given specifications.
	PO12	**3**	Knowledge imparted in design and development of the controllers such that its made useful in learning advanced aspects.

	PSO1	**2**	fundamental concepts related to design of controllers for regulating process physical variables.
	PSO2	**3**	Complete design and development of automatic control system for the given specifications in the in both analog and digital domain.
	PSO3	**2**	Knowledge imparted enables to analyse and apply control strategies, but predictive techniques with analysing statistical parameters to be considered.
CO4	**PO1**	**3**	laws of physics w.r.t dynamic variables of a process. Apply the mathematical formulae, empirical formulas related to loop tuning and asses the quality of regulation.
	PO2	**3**	Analyse the process and its dynamic variables in obtaining the solution to regulate the process controlled variables.
	PO3	**3**	Developing solutions to self-regulating and non-self-regulating process and assess the quality of control systems.
	PO12	**3**	Knowledge imparted in obtaining solutions to regulate industrial process enable to apply in advanced control systems.
	PSO1	**3**	Knowledge imparted and the exercise related in finding solution to regulate the dynamic variable of a process.
	PSO2	**3**	Skills related to loop tuning and analyse the quality by using measures and techniques.
	PSO3	**2**	Techniques in developing solutions to bring regulation in industrial process, one can apply in diversified fields of engineering, Predictive techniques is the state-of-art
CO5	**PO1**	3	Mathematical modeling of the process systems and simulation aspects and advanced control strategies discussed.
	PO2	2	Though mathematical aspects and algorithms related to system modeling and simulation an overview is given detail discussion on algorithms AI/ML is the requirement.
	PO3	2	In depth analysis and simulation by applying statistically related aspects related to control the variables of a process is required.
	PO12	1	Only a brief overview of all the advanced control techniques/ strategies discussed.
	PSO1	2	The particular course outcome only confined to knowing modeling and simulation aspects with handful of examples.

	PSO2	**2**	Basics skills in developing the control strategies as applied to considering statistical parameters is imparted.
	PSO3	**1**	Basic fundamentals related to predictive analysis and control of process dynamic variables discussed, advanced techniques in applying predictive analysis in bringing regulation of the variables requires developing programs using AI/ML.

CO-PO Correlation Mapping Justification

Subject with Code: 15EI563 Operating Systems

2015

C No. 563

Course outcomes of OPERATING SYSTEM (15EI563)

Course Name : C563	**Year: 2015-19**
	At the end of the course, the students are able to
C563.1	Describe basic structure and functioning of OS and explain organization of computer system, and components, computing environments, network architectures, protocols and security & typical structure of OS.
C563.2	Analyze the process management, process scheduling, threads their issues and cpu scheduling algorithms
C563.3	Describe the concepts of process synchronization and analyze the problems of synchronization. Evaluate the cause and effect related to deadlocks, prevention and avoidance of the deadlocks
C563.4	Describe the techniques of memory management, virtual memory concepts, allocation and paging
C563.5	Apply appropriate disk scheduling algorithms. Describe the interfaces to file systems, file structure and implement file systems and directory structure

CO-PO mapping (Correlation Mapping)

Course Name: C563 / OPERATING SYSTEM(15EI563)												**Year: 2015-19**			
COURSE OUTCOMES	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**	**PSO3**
C563.1	3	2	2	1								2	1	1	2
C563.2	3	2	2	1								2	1	1	2
C563.3	3	2	2	1								2	1	1	2
C563.4	3	2	2	1								2	1	1	2
C563.5	3	2	2	1								2	1	1	2
C563 (Avg.)	**3.0**	**2.0**	**2.0**	**1.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**2.0**	**1**	**1**	**2**

COs-POs / PSOs Mapping	**Level**	**Justification**
CO1 → PO1	**3**	**Involves the knowledge of computer system, architectures processing fundamentals to understand the operating system services provided for various applications**
CO1 → PO2	**2**	**Supports analysis of the complex problems using basic operating system functionality**
CO1 → PO3	**2**	**Guides to design and solve complex problems using the fundamental OS structure and protocols**
CO1->PO4	**1**	**The fundamental knowledge of the operating system provides a platform for the investigation of complex problems**

CO1 → PO12	**2**	**Supports for lifelong learning on various OS architectures to solve complex problems**
CO1 → PSO1	**1**	**Fundamental concepts can be applied to measurement and control of systems**
CO1->PSO2	**1**	**The fundamentals of operating system provides a platform for the students**
CO1 → PSO3	**2**	**Maps the student's knowledge and helps in adapting to various technologies related to other disciplines**
CO2 → PO1	**3**	**Process management and thread knowledge gives a strong base for future designing and analysis**
CO2 → PO2	**2**	**Process and threads usage in the system helps analyse the issues to solve complex problems to address real time issues**
CO2 → PO3	**2**	**Various cpu scheduling algorithms in the OS guides to design the solution to vaious problems related to society**
CO2->PO4	**1**	**Concepts of process management and threads provide a platform for analyzing complex issues**
CO2 → PO12	**2**	**Latest developments in the OS features encourages for learning to match the society requirements**
CO2 → PSO1	1	**Preliminary OS architecture and structures can be mapped to solve real-time problems**
CO2->PSO2	1	**Knowledge of the basic OS structure and architecture shows a platform for updating various skill sets**
CO2 → PSO3	**2**	**Maps oneself to the technical competency from other disciplines**
CO3 → PO1	**3**	**Elementary knowledge of a deadlock situation occurring and its avoidance are applied so solve various problems in applications**
CO3 → PO2	**2**	**Analysis of problems in real time applications using the deadlock concepts and process synchronization**
CO3 → PO3	**2**	**Develop solutions for applications and problems related to society using the analysis of deadlock and process synchronization**
CO3->PO4	**1**	**Analysing the deadlock situations and synchronizing the process helps to solve complex issues**
CO3 → PO12	**2**	**Deadlock analysis to solve real time problems encourages learning**
CO3 → PSO1	**1**	**Simple domain knowledge such as OS services, multi tasking etc can be mapped to solve real-time problems**

CO3->PSO2	**1**	**Enables the students to apply the deadlock and synchronization concepts to enhance their skill sets to solve issues**
CO3 → PSO3	**2**	**Encourages oneself to technically compete with to solve real world problems**
CO4 → PO1	**3**	**Focusses on memory management required for various real time applications**
CO4 → PO2	**2**	**Techniques used in memory management and virtual memory to analyse complex problems**
CO4 → PO3	**2**	**Solutions to problems in different modern applications by using the concept of virtual memory for programming**
CO4->PO4	**1**	**Focus on memory management is possible which helps solve various memory issues**
CO4 → PO12	**2**	**Latest processors help to focus on solving issues in a better way**
CO4 → PSO1	**1**	**Analyse the design of memory systems and evaluate its performance**
CO4->PSO2	**1**	**Skill set enhancement due to the basics of virtual and memory managements will solve various issues**
CO4 → PSO3	**2**	**Across all the domains, the virtual memory concept and memory management can be mapped**
CO5 → PO1	**3**	**Better understanding in file system structure and disk scheduling while using secondary storage**
CO5 → PO2	**2**	**Focusses on analysing the issues for various applications using disk scheduling algorithms and file structures**
CO5 → PO3	**2**	**Design the solution for given application by using the features of file management to address real time issues**
CO5->PO4	**1**	**Addressing complex issues by investigating them is easily handled with the knowledge of file structures**
CO5 → PO12	**2**	**The knowledge of various file system structures and disk algorithms keeps opportunities open for learning**
CO5 → PSO1	**1**	**Concepts of directory structure, file systems and various algorithms provides new ideas to map secondary storages and manage the data better**
CO5->PSO2	**1**	**Structuring the file system along with various algorithms provide a way to work on their skill set to solve critical memory issues**
CO5 → PSO3	**2**	**OS concepts and features bridges the interdisciplinary gaps**

Course Name: (DSP-LAB)C508												Year of study: 2019-20			
Course Outcomes	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO 3**
C508.1	3	3	3	2	3							2	3	1	2
C508.2	3	3	3	2	3							2	3	1	2
C508.3	3	3	3	2	3							2	3	1	2
C508.4	3	3	3	2	3							2	3	1	2
C508.5	3	3	3	2	3							2	3	1	2
C504	3	3	3	2	3							2	3	1	2

COs Mapping	POs Mapping	Level	Justification
CO1	**PO1**	3	The knowledge of engineering mathematics and fundamentals are applied to use the sampling concept to solve various problems
	PO2	3	Identify and analyze issues related to analog, digital signals and sampling using the fundamentals of engineering to solve real time problems.
	PO3	3	Capable of analyzing any complex issues using the engineering fundamentals along with sampling theory and design appropriate methods and solutions to solve real time issues
	PO4	2	Investigate the complex issues by understanding the problems using their fundamental engineering knowledge and the digital signal processing concepts
	PO5	3	Exposure to signal processing basics and concepts using the lab tools and software gives the students a confidence to use the resources and techniques for analyzing higher end issues and provide appropriate conclusions
	PO12	2	Fundamental concepts with hands on experience provide the students a platform for learning and preparing themselves to the technological changes

	PSO1	3	The fundamental concepts of signal processing provide a confident environment to apply the specific knowledge to various systems and models to solve new problems
	PSO2	1	A strong basic knowledge of DSP and the fundamentals provide the students a strong skill set to solve issues in any field of engineering
	PSO3	2	Digital signal processing with hands on experience in the concepts help them to adapt to any field of engineering and contribute to the changing technologies
CO2	**PO1**	3	The knowledge of engineering mathematics and fundamentals such as convolution, correlation are applied to use the sampling concept to solve various problems
	PO2	3	Identify and analyze issues related to analog, digital signals and correlation in real world and solve them using the fundamentals of engineering
	PO3	3	Capable of analyzing any complex issues using the engineering fundamentals along with convolution and correlation concepts and design appropriate methods and solutions to solve real time issues
	PO4	2	Investigate the complex issues by applying the concept of convolution and correlation and the digital signal processing concepts
	PO5	3	Exposure to signal processing basics and concepts like convolution, correlation using the lab tools and software gives the students a confidence to use the resources and

			techniques for analyzing higher end issues and provide appropriate conclusions
	PO12	2	Fundamental concepts with hands on experience provide the students a platform for learning and preparing themselves to the technological changes
	PSO1	3	The fundamental concepts of signal processing provide a promising environment to apply the specific knowledge to various systems and models to solve new problems
	PSO2	1	Building a strong skill set with the basic knowledge of DSP and the fundamentals of convolution and corrrelation provide the students a strong skill set to solve issues in any field of engineering
	PSO3	2	Digital signal processing with hands on experience in the concepts help them to adapt to any field of engineering and contribute to the changing technologies as it as can be applied across various disciplines
CO3	**PO1**	3	The discrete signals, generation and handling of these signals along with the engineering mathematics are applied to solve various problems
	PO2	3	Identify and analyze issues related to discrete fourier transforms and the frequency analysis in spectrum and solve them using the fundamentals of engineering
	PO3	3	Analyze any complex issues using the engineering fundamentals along with the concepts of discrete domain signals and frequency spectrum to design appropriate methods and solutions to solve real time issues

	PO4	2	Investigate the complex issues by understanding the problems using their fundamental engineering knowledge and the digital signal processing concepts of discrete signals.
	PO5	3	Exposure to signal processing basics and concepts of DFT using the lab tools and software gives the students a confidence to use the resources and techniques for analyzing higher end issues and provide appropriate conclusions
	PO12	2	Fundamental concepts with hands on experience on discrete fourier transform provide the students a platform for learning and preparing themselves to the technological changes
	PSO1	3	The fundamental concepts of discrete fourier transformsignal processing provide a promising environment to apply the specific knowledge to various systems and models to solve new problems
	PSO2	1	Building a strong skill set with the basic knowledge of DSP and the fundamentals of convolution and corrrelation provide the students a strong skill set to solve issues in any field of engineering
	PSO3	2	Digital signal processing with hands on experience in the concepts of discrete signals and frequency spectrum help them to adapt to any field of engineering and contribute to the changing technologies as it as can be applied across various disciplines
CO4	**PO1**	3	The basic concept of filters, types of filters and applicatioin of these concepts along with the engineering mathematics to solve various problems

	PO2	3	Identify and analyze issues related to discrete fourier transforms and the frequency analysis in spectrum and solve them using the fundamentals of engineering
	PO3	3	Analyze any complex issues using the engineering fundamentals along with the concepts of filters and its types to design appropriate methods and solutions to solve real time issues
	PO4	2	Investigate the complex issues by understanding the problems using their fundamental engineering knowledge and the digital signal processing concepts of discrete signals and filter techniques.
	PO5	3	Exposure to signal processing basics and concepts of Finite and infinite impulse response filters and its types using the lab tools and software gives the students a confidence to use the resources and techniques for analyzing higher end issues and provide appropriate conclusions
	PO12	2	Fundamental concepts with hands on experience on FIR and IIR filtersprovide the students a platform for learning and preparing themselves to the technological changes
	PSO1	3	The fundamental concepts of analog and digital filters and its types provide a promising environment to apply the specific knowledge to various systems and models to solve new problems
	PSO2	1	Building a strong skill set with the basic knowledge of DSP and the fundamentals of digital and analog filter and its types provide the students a strong skill set to solve issues in any field of engineering

	PSO3	2	Digital signal processing with hands on experience in the concepts of filters, various types make the students adapt to any field of engineering and contribute to the changing technologies as it as can be applied across various disciplines
CO5	**PO1**	3	The basic concept of sampling, convolution, filters, types of filters and the hands on experience using software tools provide a sufficient knowledge along with the engineering mathematics to solve various problems
	PO2	3	Identify and analyze issues related to the basics of digital signal processing, discrete fourier transforms and the frequency analysis in spectrum along with filter types and solve them using the fundamentals of engineering
	PO3	3	Analyze any complex issues using the signal processing fundamentals along with the concepts of filters and its types to design appropriate methods and solutions to solve real time issues
	PO4	2	Fundamental signal processing concepts of discrete signals and filter techniques worked on the software tools provide the students a strong platform to Investigate the complex issues
	PO5	3	Hands on experience to signal processing basics and concepts of Finite and infinite impulse response filters and its types using the lab tools and software gives the students a confidence to use the resources and techniques for analyzing higher end issues and provide appropriate conclusions
	PO12	2	Fundamental concepts with hands on experience on FIR and IIR filters provide the students a platform for learning and preparing themselves to the technological changes

	PSO1	3	The fundamental concepts of analog and digital filters and its types experienced on the software tools and the processor kit provide a promising environment to apply the specific knowledge to various systems and models to solve new problems
	PSO2	1	Building a strong skill set with experimenting the basic knowledge of DSP and the fundamentals of digital and analog filter and its types provide the students a strong skill set to solve issues in any field of engineering
	PSO3	2	Digital signal processing with hands on experience using software tools and the processor kit in the concepts of filters, various types make the students adapt to any field of engineering and contribute to the changing technologies as it as can be applied across various disciplines

Analog and Digital Communication Systems (15EI61)

Course Name:C601	Year:2019-20
	At the end of the course, the students are able to
C601.1	Analyse simple systems for generation and detection of AM, DSB, SSB and VSB signals.
C601.2	Describe the concepts and performance of frequency modulation schemes.
C601.3	Explain the concepts of sampling theorem, and pulse modulation and demodulation techniques
C601.4	Analyse systems for generation and detection of digital modulation systems and assess its performance
C601.5	Describe the operation of WPAN technologies, protocols and cellular networks,

Analog and Digital Communication Systems (15EI61)

Course Name: C601												Year of study: 2019-20			
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
C601.1	3	2	2									2	3	2	2
C601.2	3	3	2									2	2	2	1
C601.3	3	3	2									3	2	2	2
C601.4	3	2	2									2	3	2	2
C601.5	3	3	2									2	2	2	1
C503 avg	3.0	2.6	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.4	2.0	1.6

CO-PO Correlation Mapping Justification

Subject with Code: 15EI661 Mobile Communication

2015- Nisha Batch

C No. 661

Course outcomes of MOBILE COMMUNICATION (15EI661)

Course Name : C661	Year: 2015-19
	At the end of the course, the students are able to
C661.1	Acquire the knowledge of Radio frequencies, their regulations, transmission of signals, various multiplexing techniques such as SDMA, FDMA, CDMA, TDMA.
C661.2	Describe the process of accessing the medium for wireless communication, problems associated with it, the concepts of various multiplexing techniques
C661.3	Understand the Bluetooth concepts, Internet protocol (IP) versions and their mobility support
C661.4	Analyze the important issues involved in adhoc routing and networking.
C661.5	Acquire knowledge on the cellular networks like- GSM, UMTS and various satellites like GEO,LEO, MEO and their communication, TCP layer

CO-PO mapping (Correlation Mapping)

Course Name: C661 / MOBILE COMMUNICATION (15EI661)													Year: 2015-19			
COURSE OUTCOMES		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C15EI661.1	CO 1	3	2	2	1								1	1	1	2
C15EI661.2	CO 2	3	2	2	1								1	1	1	2
C15EI661.3	CO 3	3	2	2	1								1	1	1	2
C15EI661.4	CO 4	3	2	2	1								1	1	1	2
C15EI661.5	CO 5	3	2	2	1								1	1	1	2
C661(avg)		3.0	2.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	2.0

COs-POs / PSOs Mapping	Level	Justification
CO1 → PO1	3	Involves the knowledge of basic communication fundamentals to understand their implementations on various applications
CO1 → PO2	2	Supports analysis of the complex problems using basic mathematics
CO1 → PO3	2	Guides to design and solve complex problems using the fundamental concepts like various multiplexing techniques
CO1->PO4	1	The concept of radio frequencies and various multiplexing techniques gives a good hand to investigate various problems
CO1 → PO12	1	Radio frequency signals and their application encourages for lifelong learning

CO1 → PSO1	**1**	**Fundamental concepts can be applied to measurement and control of systems**
CO1->PSO2	**1**	**Finding solution to various issues is possible through the knowledge of multiplexing**
CO1 → PSO3	**2**	**Maps the student's knowledge and helps in adapting to various technologies related to other disciplines**
CO2 → PO1	**3**	**Fundamental knowledge about the wireless communication provides a strong base for future designing and analysis**
CO2 → PO2	**2**	**Wireless communication problems and various multiplexing techniques guides to analyse the real time issues**
CO2 → PO3	**2**	**Development of solutions to the problems related to wireless communication in real world applications**
CO2->PO4	**1**	**Multiplexing techniques in communication will be the guideline to investigate on various issues**
CO2 → PO12	**1**	**Requirements in the real world applications always encourages for learning to match the society requirements**
CO2 → PSO1	1	**Basic communication concepts can be mapped to solve real-time problems**
CO2->PSO2	1	**Multiplexing techniques in communication will be providing a platform for various skill sets**
CO2 → PSO3	**2**	**Maps oneself to the technical competency from other disciplines**
CO3 → PO1	**3**	**Focussed understanding of various communication protocols can be applied to various applications**
CO3 → PO2	**2**	**Analysing the intensity of problems in various applications supported by applying communication protocols**
CO3 → PO3	**2**	**Develop solutions for applications and problems related to society using different technologies**
CO3->PO4	**1**	**Focus on various communication protocol guides to solve and investigate complex**
CO3 → PO12	**1**	**Recent technology learnings encourages to address the problem**
CO3 → PSO1	**1**	**Fundamentals of communication can be mapped to solve real-time problems**
CO3->PSO2	**1**	**Concepts of Bluetooth and other communication concepts provide platform for skillset development to solve various issues**

CO3 → PSO3	**2**	**Encourages oneself to technically compete with to solve real world problems**
CO4 → PO1	**3**	**Focusses on adhoc communication and networking for various real time applications**
CO4 → PO2	**2**	**Networking protocols help to analyse complex problems**
CO4 → PO3	**2**	**Solutions to problems can be designed in different modern applications by various protocols and adhoc connections**
CO4->PO4	**1**	**Fundamentals of networking issues and adhoc protocols encourages to investigate the issues and solve them**
CO4 → PO12	**1**	**Latest adhoc communication updates and networking issues help to focus on solving issues in a better way**
CO4 → PSO1	**1**	**Communication knowledge with all latest technology updates eases the problem solving**
CO4->PSO2	**1**	**Communication protocols across domains provide a platform for working on the skill set to solve issues**
CO4 → PSO3	**2**	**Across all the domains, communication application can be mapped**
CO5 → PO1	**3**	**Better understanding of the satellites and communication in various orbits**
CO5 → PO2	**2**	**Focusses on analysing the practical issues related to communication using satellites**
CO5 → PO3	**2**	**Design the solution for given application by analysing the networking and transport layers to address real time issues**
CO5->PO4	**1**	**Fundamentals of networking and transport layer protocols encourages to investigate the issues and solve them**
CO5 → PO12	**1**	**The knowledge of recent communication protocols keeps opportunities open for learning**
CO5 → PSO1	**1**	**Concepts of communication through OSI layers supports to solve complex issues**
CO5->PSO2	**1**	**Communication protocols across domains provide a platform for working on the skill set to solve issues**
CO5 → PSO3	**2**	**Communication protocols and methods to address issues bridges the interdisciplinary gaps**

Course Information Sheet

Faculty **Dr. Mallikarjun H M**

Email mallikarjun18@gmail.com **or** mallikarjun.h.m@rnsit.ac.in

Contact Number **9743207651**

Contact Time **4hrs/week**

Class Room 104

Program: Electronics & Instrumentation Engineering	**Degree:** B.E
Course: Real Time Operating System	**Semester:** VII
Course Code: 15EI744	**Regulation / Scheme:** 2015
No. of Lecture Hours / Week: 04 **Total No. of Lecture Hours :** 40	**IA Marks:** 20 **Exam Marks:** 80
	Exam Hours: 03

Course outcomes of Real Time Operating System (15EI744)

Course Name: C744	
	At the end of the course, the students are able to
C744.1	Describe theoretical and practical concepts, and functioning of operating system.
C744.2	Distinguish a real-time system from other systems
C744.3	Discuss the specifications, design requirements and kernel techniques in development of RTOS.
C744.4	Evaluate real time operating systems based on real time applications with different models.
C744.5	Implement the real-time operating system principles.

CO-PO mapping (Correlation Mapping)

Course Name: C744/ **Real Time Operating System** (15EI744)															
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C744.1	3	2	2	1								2	1	1	2
C744.2	3	2	2	1								2	1	1	2
C744.3	3	2	2	1								2	1	1	2
C744.4	3	2	2	1								2	1	1	2
C744.5	3	2	2	1								2	1	1	2
C744 (Avg.)	3.0	2.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	1.0	1.0	2.0

Course Information Sheet

Faculty **Dr. Mallikarjun H M**

Email mallikarjun18@gmail.com **or** mallikarjun.h.m@rnsit.ac.in

Contact Number **9743207651**

Contact Time **4hrs/week**

Class Room ARM Processor Lab

Program: Electronics & Instrumentation Engineering	**Degree:** B.E
Course: ARM Processor Lab	**Semester:** VII
Course Code: 15EIL77	**Regulation / Scheme:** 2015
No. of Lecture Hours / Week: 03 (1I+2P) **Total No. of Lecture Hours :** 42	**IA Marks:** 20 **Exam Marks:** 80
	Exam Hours: 03

Course outcomes of ARM Processor Lab (15EIL77)

Course Name: C707	
	At the end of the course, the students are able to
C707.1	Write ALP for implementation of specific arithmetic or logical operations.
C707.2	Write programs to demonstrate functioning of various devices interfaced to ARM processor.
C707.3	Develop programs for ARM processors to implement real world problems.
C707.4	Design and develop mini projects.

CO-PO mapping (Correlation Mapping)

Course Name: C707/ ARM Processor Lab (15EIL77)															
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C707.1	2	3	2	2								3	3	1	3
C707.2	2	3	1	2								3	3	1	3
C707.3	2	3	2	2								3	3	1	2
C707.4	2	3	1	2								3	3	1	2
C707 (Avg.)	2.0	3.0	1.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	1.0	2.5

B. E. Electronics and Instrumentation Engineering

Semester VII

Automation in Process Control

(15EI71)

After studying this course, the students will be able to;

C701.1 Describe the architecture, functioning and applications of PLC in automation.

C701.2 Recognize various I/O modules of PLC and apply programming concepts to interface peripherals.

C701.3 Design and analyze the ladder diagram program using different PLC instruction sets.

C701.4 Discuss the various distributed control system and its architecture to develop an automation system.

C701.5 Analyze the basics of SCADA and communication protocols used in automation industries.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C701.1	3	3	2	2	3							3	3	2	3
C701.2	2	3	2	2	2							2	2	1	3
C701.3	3	2	3	2	2							3	3	2	2
C701.4	2	3										3	2	1	2
C701.5	3	2										3	3	1	3
Average	**2.6**	**2.6**	**2.3**	**2.0**	**2.3**							**2.8**	**2.6**	**1.4**	**2.6**

ARM PROCESSOR (18EI72)

Course Name:C703	Year:2020-21
	At the end of the course, the students are able to
C702.1	Depict the organization, architecture, bus technology, memory and operation of the ARM microprocessors.
C702.2	Employ the knowledge of Instruction set of ARM processors to develop basic Assembly Language Programs.
C702.3	Recognize the importance of the Thumb mode of operation of ARM processors and develop C programs for ARM processors.
C702.4	Describe the techniques involved in Exception and Interrupt handling in ARM Processors and understand the fundamental concepts of Embedded Operating Systems.
C702.5	Develop embedded C programs to interact with Built in Peripherals and develop programs using RTOS (Micro C/OS) on ARM based development boards.

Table 3.1.2.7 CO PO/PSO of matrix of ARM PROCESSOR (18EI72)

Course Name: C703												Year of study: 2020-21			
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C702.1	3	3	2	3	2							1	3	3	3
C702.2	3	3	2	3	2				2			1	3	3	3
C702.3	3	3	3	3	2				2			2	3	3	2
C702.4	3	2	3	2	1				2			2	3	2	2
C702.5	3	3	3	1	1							2	2	2	2
C702 avg	**3.0**	**2.8**	**2.6**	**2.4**	**1.6**	**0.0**	**0.0**	**0.0**	**1.2**	**0.0**	**0.0**	**1.6**	**2.8**	**2.6**	**2.4**

Course Name: (Virtual Instrumentation)C753												Year of study: 2015-16			
Course Outcomes	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO 3**
C753.1	3	2	2	2	2							2	3	2	2
C753.2	3	2	2	2	2							2	3	2	2
C753.3	3	2	2	2	2							2	3	2	2
C753.4	3	2	2	2	2							2	3	2	2
C753.5	3	2	2	2	2							2	3	2	2
C753	3	2	2	2	2							2	3	2	2

B. E. Electronics and Instrumentation Engineering

Semester VIII

Neural Networks and Fuzzy Logic System

(15EI81)

After studying this course, the students will be able to;

C801.1 Discuss the single layer, multilayer network architecture and understanding the differences between biological neural network and ANN.

C801.2 Analyze the ANN for pattern classification.

C801.3 Develop and configure ANNs with different types of functions and learning algorithms for real world problems

C801.4 Discuss the fundamentals of fuzzy logic, implementation and their functions.

C801.5 Apply fuzzy logic concepts in building automated control systems.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C801.1	3	3	3	2	2	1						3	1	2	3
C801.2	2	3	3	2	2	1						2	2	2	2
C801.3	2	2	2	3	2	1						3	1	3	3
C801.4	3	3	2	3	3	1						3	1	3	2
C801.5	3	2	3	3	2	1						3	1	2	2
Average	**2.6**	**2.6**	**2.6**	**2.6**	**2.2**	**1.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1.0**	**2.8**	**1.2**	**2.4**	**2.4**

LASERs and Optical Instrumentation 15EI82
Staff : Dr. Andhe Pallavi

Course Outcomes:

After studying this course, students are able to:

1. Explain the principle and working of Laser systems
2. Discuss the engineering applications of laser systems
3. Discuss the fundamentals of optical fiber communications
4. Evaluate the design of optical fibers
5. Apply fiber optic laser systems in medical field
6. Design the laser output modifications to facilitate engineering applications of laser systems

Course Name : C802															Year of study: 2018 - 19
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C802.1	3	3	3	1								3	3		2
C802.2	3	3	3	1		1						3	3		2
C802.3	3	3	3	1		1						3	3		3
C802.4	3	3	3	1								3	3		3
C802.5	3	3	3	1		1	3	2				3	3		3
C802.6	3	3	3	1								1	3		1
C802	3.0	3.0	3.0	1.0	0.0	1.0	3.0	2.0	0.0	0.0	0.0	2.7	3.0	0.0	2.3

CIE TARGET: 50% ; SEE TARGET: 6.75 (Average Grade Point)

SEE targets	
0-4	0
4.01-5.99	1
6.00-6.99	2
7 & above	3

CIE TARGET				LEVEL
75%	% STUDENTS MUST SCORE	50	% & ABOVE	3
60%	% STUDENTS MUST SCORE	50	% & ABOVE	2
45%	% STUDENTS MUST SCORE	50	% & ABOVE	1

INTERNAL ASSESSMENT Target>=50			
Test Assessment			Qz & A
CO1	34	65%	98%
CO2	40	77%	98%
CO3	29	56%	98%
CO4	24	46%	98%
CO5	44	85%	98%
CO6	27	52%	98%
Average %		63%	98%
Average Level		1.43	0.74

Internal Marks Weightage	
Tests IA	Quiz + Assign
75%	25%

CLASS STRENGTH	52
SET TARGET FOR INTERNAL ASSESSMENT (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Average CO Attainment in CIE = 60%

Course outcome Attainment:

Course outcome Attainment of LASERs and Optical Instrumentation (15EI82) Year: 2018 -19												
Course Name	CO1		CO2		CO3		CO4		CO5		CO6	
	%	Level	%	Level	%	Level	%	Level	%	Level	%	Level
C802	65	2	77	3	56	1	46	1	85	3	52	2
Max Marks	54*		36		63		27		54		36	

* -- **6 questions of 9 marks each = 54**

Course outcome attainment of 2015-19 EI batch in Eighth semester
Final CO Attainment level (20% CIE + 80% SEE) → Level 2
(SEE Average Grade Point : 6.60 → Level 2)
Table 3.3.2.8: CO-PO attainment of 2015-19 EI batch in Eighth semester

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C802	2.0	2.0	2.0	0.7	0.0	0.7	2.0	1.3	0.0	0.0	0.0	1.8	2.0	0.0	1.6
Target	3.0	3.0	3.0	1.0	0.0	1.0	3.0	2.0	0.0	0.0	0.0	2.7	3.0	0.0	2.3

LASERs and Optical Instrumentation
10IT81 / 10EI81 / 15EI82
Staff : Dr. Andhe Pallavi

Course Outcomes:

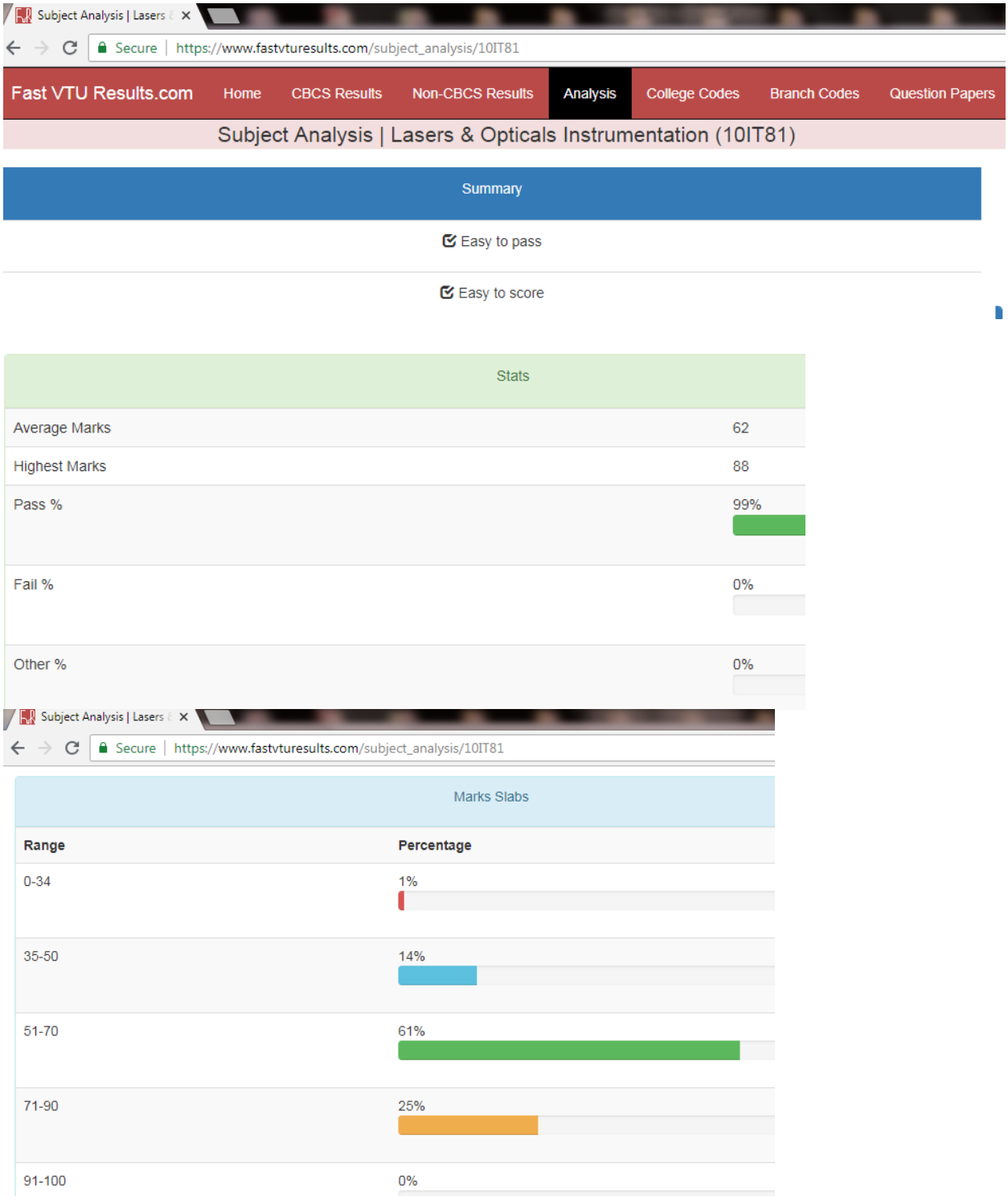
After studying this course, students will able to:

1. Relate to the concepts of various lasers (construction/ operation / applications of the four classes of lasers namely Doped insulator, Semiconductor, Gas and Liquid dye lasers).
2. Analyze the various enhancement techniques involved laser generation.
3. Discuss the appropriate usage of different lasers in various applications.
4. Explicate the essentials of optoelectronics and its applications.

CO1: Explain the principle and working of Laser systems
CO2: Discuss the engineering applications of laser systems.
CO5: Apply fiber optic laser systems in medical field
CO3: Discuss the fundamentals of optical fiber communications.
CO4: Evaluate the design of optical fibers.
CO6: Design the laser output modifications to facilitate engineering of laser systems.

Course Outcomes: After studying this course, students will be able to:
1. Explain the principle and working of Laser system.
2. Discuss the engineering applications of laser systems.
3. Discuss the fundamentals of optical fiber communications.
4. Evaluate the design of optical fibers.
5. Apply fiber optic laser systems in medical field.

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 12	PS O1	PS O2	PS O3
C801.1	3	3	3	1				3	3	1	1
C801.2	3	3	3	1				3	3	1	1
C801.3	3	2	3	1		2	2	3	3	1	1
C801.4	3	3	3	2		1	2	3	3	2	1
C801 (avg)	3	2.75	3	1.25		1.5	2	3	3	1.25	1



Toppers

Name	USN	Marks
PREETI UDAPUDI	1rn12it028	88

S.MOUNIKA	3pg12it008	88
DIVYA KUNJAPPA.S	1rn11it018	86
VIGNESH.P.R	1ds12it047	86
FOUZIA B	3pg12it004	86
PRADEEP .K	1rn12it026	85
SYED TASNEEM WAFA	3pg12it009	85
T.SAMIYA	3pg12it011	85
SHREEDEVI B R	1kn09it026	84
SUMANGALA N SUNADHOLI	1ds12it042	84
GOUTAM GAJANAN BHAT	1rn12it013	84
SANJANA.A.M	1bi12it041	84
RAJATH V	1rn12it032	84
RADHIKA P MANSABDAR	3kb10it035	83
PRAGATHI V B	1js12it025	83
SNEHA SHREE D S	1rn12it050	83
RASHMITHA RAO U	1rn12it036	83
SUNIL KUMAR M	3vc10it020	82
ASHOK KUMAR	3vc11it400	82
JAGADEK JEWARGI	1rn10it019	82

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
2. Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations
4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice – **laser safety**
7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development - **Usage of fiber optic imaging in medicine, industrial automation**
8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice – **Usage of fiber optic imaging in medicine, industrial automation**

Program Specific Outcomes (PSOs)
Instrumentation Engineers are able to:

1. Domain Knowledge: relate the fundamental concepts of Instrumentation (measurement, control, operation, monitoring and maintenance) to varied measurement systems and models.
2. Skill Set: design and develop automatic control system for the given specifications in the allied fields of engineering.
3. Adaptability: adapt and migrate to changing interdisciplinary technologies to provide improvised solutions.

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
805	15EIP85	Project work phase II

Staff: Mrs. Sneha G Chachadi

Course outcomes of Project work phase II (15EIP85)

1. Design and develop the project and be able to defend it.
2. Develop critical thinking and problem-solving skills.
3. Learn to use modern tools and techniques.
4. Develop skills to work in a team to achieve common goal, project management and finance.
5. Develop skills of self-learning, evaluate their learning and take appropriate actions to improve it.
6. Prepare themselves for life-long learning to face the challenges and support the technological changes to meet the societal needs.

CO-PO mapping (Correlation Mapping)

Course Name: C805														Year: 2015-19
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PSO 3
C805.1	3	3	3				2	2	3	2	1		2	3	2
C805.2	3	3	3	3	3			1	2			2		1	
C805.3	3	2	2	1					2	1		1	2		
C805.4	3	2	3			2			3	2	3	2			
C805.5	3	3	3	1					3					1	
C805.6	2	2	3	1					3	1		3			
C805 (Avg.)	2.8	2.5	2.8	1.5	3	2	2	1.5	2.7	1.5	2	2	2	1.7	2

Course Information Sheet

Faculty **Dr. Mallikarjun H M**

Email mallikarjun18@gmail.com **or** mallikarjun.h.m@rnsit.ac.in

Contact Number **9743207651**

Contact Time **4hrs/week**

Class Room 104

Program: Electronics & Instrumentation Engineering	**Degree:** B.E
Course: Industrial Process Instrumentation	**Semester:** VIII
Course Code: 15EI832	**Regulation / Scheme:** 2015
No. of Lecture Hours / Week: 04 **Total No. of Lecture Hours :** 40	**IA Marks:** 20 **Exam Marks:** 80
	Exam Hours: 03

Course outcomes of Industrial Process Instrumentation (15EI832)

Course Name: C832	
	At the end of the course, the students are able to
C832.1	Sketch the typical instrumentation and control strategy in the process industries like paper, pulp, cement, power and steel plants.
C832.2	List the variable to be monitored and controlled in the above said process industries.
C832.3	Describe the instrumentation, control requirements and complete functioning of the above said industries.
C832.4	Analyze the hardware and software tools required for the above said process industries.
C832.5	Design and develop instrumentation and control strategy for simple process industry

CO-PO mapping (Correlation Mapping)

Course Name: C832/ **Industrial Process Instrumentation (15EI832)**															
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C832.1	3	3	1	2				2				3	3	1	2
C832.2	3	3	1	1				2				3	3	1	2
C832.3	3	3	1	1				3				3	3	1	2
C832.4	3	3	1	1				3				3	3	1	2
C832.5	3	3	2	1				3				3	3	1	2
C832(Avg.)	3.0	3.0	1.2	1.2	0.0	0.0	0.0	2.6	0.0	0.0	0.0	3.0	3.0	1.0	2.0

B. E. Electronics and Instrumentation Engineering

Semester VIII

Internship / Professional Practice

(15EI84)

After studying this course, the students will be able to;

C804.1 Apply knowledge and skills learnt to acquire practical experience within industry in which the internship is done.

C804.2 Experience the activities, functions of professionals and develop oral and written communication skills.

C804.3 Recognize the areas for future knowledge and skill development.

C804.4 Acquire the basic knowledge of administration, marketing, finance and economics.

C804.5 Develop the skills to enable lifelong learning.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C804.1	3	3	3	3	3			3	2	2	1	3	3	3	3
C804.2	3	2	1						3	3	3	3	1	1	3
C804.3	3	3	2	3	3			2		3	3	3	1	3	2
C804.4				2		2	1	3	3	3	3	3	1	2	3
C804.5	3	3	2	3	3			3	3	3	3	3	3	3	3
Average	**3.0**	**2.8**	**2.0**	**2.8**	**3.0**	**2.0**	**1.0**	**2.8**	**3.3**	**2.8**	**2.6**	**3.0**	**1.8**	**2.4**	**2.8**

Course Name:C806	Year:2015-16
	At the end of the course, the students are able to
C806.1	Develop knowledge in the field of Electronics & Instrumentation Engineering and other disciplines through independent learning and collaborative study.
C806.2	Identify and discuss the current, real-time issues and challenges in engineering & technology.
C806.3	Develop written and oral communication skills.
C806.4	Explore concepts in larger diverse social and academic contexts.
C806.5	Apply principles of ethics and develop the skills to enable life-long learning.

Course Name: (Seminar)C86								Year of study: 2015-16							
Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C86.1	3	3	3	3	3			3	2	2	1	3	3	2	3
C86.2	3	3	3	2	2			3	2	3	1	3	3	2	3
C86.3	3	2						3	2	3	1	3	2	1	2
C86.4	3	1				1		2	1	2		3	1	1	2
C86.5	3	2	2	2				2	2		1	3	2	3	3
C86	3	2	2	2	2							2	3	2	2

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME	FACULTY NAME
302	18EI32	ELECTRONIC INSTRUMENTATION AND MEASUREMENTS	Madhura G

Course outcomes of Electronic Instrumentation and Measurements

Course Name : C302	Year: 2018-22
C302.1	Describe the methods, functions, applications and static characteristics of various types of measurement systems and identify the type of errors in measuring instruments.
C302.2	Examine the principle, construction and working of different analog and digital measuring instruments like voltmeters, ammeters multimeters and frequency meters.
C302.3	Illustrate the principle and working of various types of analog and digital CROs and their usage in the measurement of various electrical parameters.
C302.4	Discuss the constructional and functional aspects of various types of electronic test equipments like RF and AF signal generators and electrical bridge networks for the measurement of R, L and C
C302.5	Describe methods, construction, working, advantages and disadvantages of analog and digital display systems and recorders

CO-PO mapping (Correlation Mapping)

Course Name: C302															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C302.1	3	3	2	1	-	-	-	-	-	1	-	1	3	1	1
C302.2	3	3	2	1	-	-	-	-	-	1	-	1	3	2	2
C302.3	3	2	2	1	-	-	-	-	-	1	-	1	3	1	2
C302.4	3	2	2	1	-	-	-	-	-	1	-	1	3	1	1
C302.5	3	3	2	1	-	-	-	-	-	1	-	1	3	1	1
C302 (Avg.)	3.0	2.6	2.0	1.0						1.0		1.0	3.0	1.2	1.4

Course outcome Attainment:

Course outcome Attainment of Electronic Instrumentation and Measurements (18EI32) Year: 2018-22										
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C302	80%	3	80%	3	80%	3	80%	3	80%	3

Course outcome Attainment of Electronic Instrumentation and Measurements (18EI32)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C505	80%	3	90%	3	77.2%	3	3

CIE targets		SEE targets		
Below 45	0	0-4	<45	0
45-60	1	4.01-5.99	45-60	1
60-75	2	6.00-6.99	60-70	2
75 above	3	7 & above	70&above	3

Final PO Attainment

PO Attainment of Electronic Instrumentation and Measurements(18EI32)													Year: 2018-22		
Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS 02	PS03
C302	3.0	2.6	2.0	1.0						1.0		1.0	3.0	1.2	1.4

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME	Faculty
306	18EI36	NETWORK ANALYSIS	CG

Course outcomes of NETWORK ANALYSIS

Course Name : C306	**Year: 2018-22**
C306.1	Solve Circuits using source transformation, mesh and nodal analysis
C306.2	Apply various theorems to solve the given network
C306.3	Infer and evaluate the transient response and Steady state response
C306.4	Obtain the two-port network parameters of the given two port network
C306.5	Analyze the series resonant and parallel resonant circuits.
C306.6	Realize the solution of the resistive networks using tie-set/ cut-set network topology concepts

CO-PO mapping (Correlation Mapping)

Course Name: C306														**Year: 2018-22**
COURSE OUTCOMES	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS O2**	**PS O3**
C306.1	3	3	3	3								3	2	2	1
C306.2	3	3	3	3								3	1	1	
C306.3	3	2	2	2								3	2	1	
C306.4	3	3	3	3								3	2	2	
C306.5	3	3	3	3								3	2	2	
C306.6	3	2	3	3								3	1		
C306 (Avg.)	**3**	**2.7**	**2.8**	**2.8**								**3**	**1.7**	**1.6**	**1**

Course outcome Attainment:

Course outcome Attainment of Network Analysis (18EI36)												**Year: 2018-22**
Course Name	**CO1**		**CO2**		**CO3**		**CO4**		**CO5**			
	%	**Level**	**%**	**Level**	**%**	**Level**	**%**	**Level**	**%**	**Level**	**%**	**Level**
C505	83	3	66	2	79	3	87	3	68	2	83	3

Course outcome Attainment of Network Analysis(18EI36)							**Final attainment level**
Course Name	**CIE***				**SEE**		
	CO(%)	**Level (X1)**	**Q&A(%)**	**Level (X2)**	**SEE%**	**Level (X3)**	
C505	78%	3	96%	3	76.26	3	3

CIE targets		**SEE targets**		
Below 45	0	0-4	<45	0
45-60	1	4.01-5.99	45-55	1
60-75	2	6.00-6.99	55-65	2
75 above	3	7 & above	65&above	3

Final PO Attainment

PO Attainment of Network Analysis (18EI36)														**Year: 2018-22**	
Course	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PS0 2**	**PS0 3**
C306	**3**	**2.7**	**2.8**	**2.8**								**3**	**1.7**	**1.6**	**1**

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME	FACULTY
501	18EI35	TRANSDUCERS AND INSTRUMENTATION	S J SAVITA

Course outcomes of Transducers and Instrumentation

Course Name: C305	Year: 2018-22
C305.1	Identify the suitable transducer for the specific application of measurement and apply suitable noise removal technique in the design of measuring instruments.
C305.2	Interpret and analyse the static and dynamic characteristics of instruments.
C305.3	Discuss the principle and working of various transducers for displacement and level measurements
C305.4	Apply functional aspects and use transducers for strain,force and torque measurement.
C305.5	Describe functional aspects, usage of different transducers for pressure, speed, sound and thickness measurement.

CO-PO mapping (Correlation Mapping)

Course Name: C505															
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C305.1	2	3	2	2								3	3	1	3
C305.2	2	3	1	2								3	3	1	3
C305.3	2	3	2	2								3	3	1	2
C305.4	2	3	1	2								3	3	1	2
C305.5	2	3	1	1								3	3	1	3
C305 (Avg.)	2.0	3.0	1.4	1.8								3.0	3.0	1.0	2.6

Course outcome Attainment:

Course outcome Attainment of Transducers and Instrumentation (18EI35)										Year: 2018-22
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C505	77.78%	3	77.78%	3	77.78%	3	77.78%	3	77.78%	3

Course outcome Attainment of Transducers and Instrumentation (18EI35)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C505	77.78%	3		3	66.09%	2	

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of Transducers and Instrumentation (18EI35)												Year: 2018-22			
Course Name	**PO1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS 02**	**PS03**
C505	1.33	0.93	1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.67	1.73	1.33

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME	Faculty
501	18EI45	PROCESS INSTRUMENTATION	S J Savita

Course outcomes of Process Instrumentation

Course Name: C405	Year: 2018-22
C405.1	Discuss the construction and working Principle of transducers/sensors for the measurement of temperature for various ranges.
C405.2	Apply suitable Flow meters for measurement of fluid flow in industrial applications.
C405.3	Select the appropriate instruments for measurement of vibration and density.
C405.4	Install and analyze the transducers/sensors for the measurement of viscosity and turbidity.
C405.5	Choose the suitable sensors/instrument for the measurement of Humidity and Moisture

CO-PO mapping (Correlation Mapping)

Course Name: C505												Year: 2018-22			
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C405.1	3	2	2									2	3	1	2
C405.2	3	2	2									1	3	2	2
C405.3	3	2	3									2	3	1	1
C405.4	3	2	2									1	3	2	2
C405.5	3	2	2									1	3	2	1
C405 (Avg.)	3	2	2.2									1.4	3	1.6	1.6

Course outcome Attainment:

Course outcome Attainment of Process Instrumentation (18EI45) Year: 2018-22										
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C405	80%	3	80%	3	80%	3	80%	3	80%	3

Course outcome Attainment of Process Instrumentation (18EI45)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C405	80%	3	82%	3	8.64%(grade point)	3	3

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of Process Instrumentation (18EI45) Year: 2018-22														
Course Name	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS 02**	**PS03**
C505	**3**	**2**	**2.2**									**1.4**	**3**	**1.6**	**1.6**

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
407	18EIL47	EMBEDDED CONTROLLERS LAB

Course outcomes of Embedded Controllers Lab (18EIL47)

Course Name : C407	Year: 2018-22
	At the end of the course, the students are able to
C407.1	Get hands-on exposure in 8051 and MSB 430 platform.
C407.2	Enhance programming skills using Assembly language and C.
C407.3	Design and interfacing of microcontroller based embedded systems.
C407.4	Build projects

CO-PO mapping (Correlation Mapping)

Course Name: C407															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C407.1	3	1	1	1	2							2	1	1	1
C407.2	3	2	2	2	2							2	1	2	1
C407.3	3	3	2	3	2							3	2	1	2
C407.4	3	3	2	3	2							2	2	2	1
C407 (Avg.)	3.0	2.3	1.8	2.3	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	1.5	1.5	1.3

Course outcome Attainment:

Course outcome Attainment of Embedded Controllers Lab (18EIL47)								Year: 2018-22
Course Name	CO1		CO2		CO3		CO4	
	%	Level	%	Level	%	Level	%	Level
C407								

Course outcome Attainment of Embedded Controllers Lab (18EIL47)						Final attainment level
Course Name	CIE*				SEE	
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C407							

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.75	1
60-75	2	5.76-6.75	2
75 above	3	6.75 & above	3

Final PO Attainment

PO Attainment of Embedded Controllers Lab (18EIL47)															Year: 2018-22
Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS 02	PS03
C407	3.0	2.3	1.8	2.3	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	1.5	1.5	1.3

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
505	18EI53	Process Control Systems (18EI53)

Course outcomes of Process Control Systems (18EI53)

Course Name : C503	Year: 2018-22
	At the end of the course, the students are able to
C503.1	Apply the principles of process control, in process evaluation, data representation and the elements of final control operation.
C503.2	Analyse the principle and working of continuous and discontinuous controller modes.
C503.3	Design analog controllers using op-amps. Digital controllers for the given specifications and develop software program for implementing controller modes,
C503.4	Analyse control loop characteristics, process loop tuning, and assess the quality, able to identify instrumentation symbols.
C503.5	Explain the concepts and applications of modelling and simulation of process plant inclusive of multivariable and intelligent controllers.

CO-PO mapping (Correlation Mapping)

Course Name: C503															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C503.1	3	3	2									3	3	2	2
C503.2	3	3	3									2	3	3	3
C503.3	3	3	3	2								3	3	3	2
C503.4	3	3	3	2								3	3	3	2
C503.5	3	2	2									1	2	2	2
C503 (Avg.)	3.0	2.8	2.6	2.0								2.4	2.8	2.6	2.2

Course outcome Attainment:

Course outcome Attainment of Process Control Systems (15EI53)										Year: 2018-22
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C503	94	3	94	3	100	3	100	3	74	2

Course outcome Attainment of Process Control Systems (15EI53)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C503	92	3	98	3	83	3	3

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of Process Control Systems (18EI53)															Year: 2018-22
Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS 02	PS03
C503	3.0	2.8	2.6	2.0								2.4	2.8	2.6	2.2

CO-PO Correlation Mapping and Justification

Subject with Code: Process Control Systems (18EI53)

COs-POs / PSOs Mapping		Level	Justification
CO1	PO1	3	Laws of physics and mathematical representation of the devices and transfer functions, engineering fundamentals in understanding process and its characteristic's.
	PO2	3	Analysing the closed loop process control systems and assess the performance, using different techniques.
	PO3	2	Designing basic closed loop control systems to provide control of the interested dynamic variable for the given specifications, however design strategies for complex systems not covered in this course outcome.
	PO12	3	Basics of the process behaviour and control systems enables to apply in learning advanced applications and complex sub systems and systems.
	PSO1	3	Knowledge related to fundamentals related to elements of the process and its behaviour with respect to regulating dynamic variable, including DDC and networking of process is dealt.
	PSO2	2	Design and development of process control systems requires understanding the underlaying aspects of the process is exercised, Advanced aspects of control is taught in this course outcome.
	PSO3	2	An overview of the process and its characteristics, present control strategies taught which enable to apply knowledge in other engineering fields.
CO2	PO1	3	Mathematical relationship input and output of the controllers (Discontinuous controller modes: Two position, multiposition, floating control modes. Continuous controller modes: Proportional (P), Integral (I), Derivative (D) control modes, Composite controller modes: PI, PD, PID modes)
	PO2	3	Conceptual understanding of the controllers, response of the controllers with respect to input and outputs, behaviour of the controllers with dynamic errors.
	PO3	3	Design of controllers and conceptual understanding along with mathematical equations helps in design and development of the controllers.
	PO12	2	Concepts of controllers helps in understanding complex designs.
	PSO1	3	Basic knowledge about process, inputs, expected output related mathematical equations.
	PSO2	3	Skillset related to designing and development and response of controllers imparted.
	PSO3	3	The imparted knowledge about controllers to control different industrial process helps to migrate and adapt to changing technologies.

CO3	**PO1**	**3**	Mathematical aspects and laws of physics applied in understanding process I/O characteristics and design of analog and digital controllers.
	PO2	**3**	Identify process variables and choosing controlling variable to control the controlled variable.
	PO3	**3**	The complete strategies to design analog and digital controllers for the given specifications.
	PO4	**2**	Designing of analog and digital controllers for the given specifications
	PO12	**3**	Knowledge imparted in design and development of the controllers such that its made useful in learning advanced aspects.
	PSO1	**2**	fundamental concepts related to design of controllers for regulating process physical variables.
	PSO2	**3**	Complete design and development of automatic control system for the given specifications in the in both analog and digital domain.
	PSO3	**2**	Knowledge imparted enables to analyse and apply control strategies, but predictive techniques with analysing statistical parameters to be considered.
CO4	**PO1**	**3**	laws of physics w.r.t dynamic variables of a process. Apply the mathematical formulae, empirical formulas related to loop tuning and asses the quality of regulation.
	PO2	**3**	Analyse the process and its dynamic variables in obtaining the solution to regulate the process controlled variables.
	PO3	**3**	Developing solutions to self-regulating and non-self-regulating process and assess the quality of control systems.
	PO4	**2**	Applying strategies to tune the process loop based on the given data specifications
	PO12	**3**	Knowledge imparted in obtaining solutions to regulate industrial process enable to apply in advanced control systems.
	PSO1	**3**	Knowledge imparted and the exercise related in finding solution to regulate the dynamic variable of a process.
	PSO2	**3**	Skills related to loop tuning and analyse the quality by using measures and techniques.
	PSO3	**2**	Techniques in developing solutions to bring regulation in industrial process, one can apply in diversified fields of engineering, Predictive techniques is the state-of-art
CO5	**PO1**	3	Mathematical modeling of the process systems and simulation aspects and advanced control strategies discussed.
	PO2	2	Though mathematical aspects and algorithms related to system modeling and simulation an overview is given detail discussion on algorithms AI/ML is the requirement.
	PO3	2	In depth analysis and simulation by applying statistically related aspects related to control the variables of a process is required.

	PO12	1	Only a brief overview of all the advanced control techniques/ strategies discussed.
	PSO1	2	The particular course outcome only confined to knowing modeling and simulation aspects with handful of examples.
	PSO2	**2**	Basics skills in developing the control strategies as applied to considering statistical parameters is imparted.
	PSO3	**1**	Basic fundamentals related to predictive analysis and control of process dynamic variables discussed, advanced techniques in applying predictive analysis in bringing regulation of the variables requires developing programs using AI/ML.

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
504	18EI54	BioMedical Instrumentation

Course outcomes of BioMedical Instrumentation

Course Name : C504	Year: 2018-22
C504.1	Elucidate the origin of bio-electric signals, types of bio-signals and their measurement
C504.2	Describe the cardiac, brain and muscular physiological systems with the related diagnostic measurement methods.
C504.3	Recognize the therapeutic methods of treatment and the associated instrumentation
C504.4	Identify and judge patient safety issues related to biomedical instrumentation.
C504.5	Describe the principle and working of cardiac pacemakers, defibrillators, BP measurement, blood flow meters, CO measurement, respiration measurements and their implementation

CO-PO mapping (Correlation Mapping)

Course Name: C504												Year: 2018-22			
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C504.1	3	1	1									2	3	1	3
C504.2	3	1	1									2	3	1	3
C504.3	3	1	1									2	3	1	3
C504.4	3	1	1									2	3	1	3
C501.5	3	1	1									2	3	1	3
C504 (Avg.)	3	1	1									2	3	1	3

Course outcome Attainment:

Course outcome Attainment of BioMedical Instrumentation (18EI54) Year: 2018-22										
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C504										

Course outcome Attainment of BioMedical Instrumentation (18EI54)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C504							

CIE targets	SEE targets

Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of BioMedical Instrumentation (18EI54) Year: 2018-22															
Course Name	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS 02**	**PS03**
C504															

BioMedical Instrumentation (18EI54) **Year: 2018-22**

ACTION/CONTINUOUS IMPROVEMENT PLANNED/ JUSTIFICATION

Action:

Improvement:

Justification for BioMedical Instrumentation (18EI54) year: 2018-22

CO/PO	CORRELATION	JUSTIFICATION
CO1-PO1	**3**	
CO2-PO2	**2**	
CO3-PO3	**1**	

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME	Faculty
505	18EI55	LASERS AND OPTICAL INSTRUMENTATION	AP

Course outcomes of LASERS AND OPTICAL INSTRUMENTATION

Course Name : C505	**Year: 2018-22**
C505.1	Explain the principle and working of Laser systems
C505.2	Discuss the engineering applications of laser systems
C505.3	Apply fiber optic laser systems in medical field
C505.4	Discuss the fundamentals of optical fiber communications
C505.5	Evaluate the design of optical fibers
C505.6	Design the laser output modifications to facilitate engineering of laser systems.

CO-PO mapping (Correlation Mapping)

Course Name: C505														**Year: 2018-22**	
COURSE OUTCOMES	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS O2**	**PS O3**
C505.1	3	3	3	1								3	3		2
C505.2	3	3	3	1		1						3	3		2
C505.3	3	3	3	1		1						3	3		3
C505.4	3	3	3	1								3	3		3
C505.5	3	3	3	1		1	3	2				3	3		3
C505.6	3	3	3	1								1	3		1
C505 (Avg.)	**3**	**3**	**3**	**1**	**0**	**1**	**3**	**2**	**0**	**0**	**0**	**2.7**	**3**	**0**	**2.3**

Course outcome Attainment:

Course outcome Attainment of LOI **(18EI55)**												**Year: 2018-22**
Course Name	**CO1**		**CO2**		**CO3**		**CO4**		**CO5**			
	%	**Level**	**%**	**Level**	**%**	**Level**	**%**	**Level**	**%**	**Level**	**%**	**Level**
C505												

Course outcome Attainment of LOI **(18EI55)**							**Final attainment level**
Course Name	**CIE***				**SEE**		
	CO(%)	**Level (X1)**	**Q&A(%)**	**Level (X2)**	**SEE%**	**Level (X3)**	
C505							

CIE targets		**SEE targets**		
Below 45	0	0-4	<45	0
45-60	1	4.01-5.99	45-55	1
60-75	2	6.00-6.99	55-65	2
75 above	3	7 & above	65&above	3

Final PO Attainment

PO Attainment of LOI (18EI55)														**Year: 2018-22**	
Course	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PS02**	**PS03**
C505															

Justification:

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
2. Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations
4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice – **laser safety**
7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development **- Usage of fiber optic imaging in medicine, industrial automation**
8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice – **Usage of fiber optic imaging in medicine, industrial automation**

Program Specific Outcomes (PSOs)

Instrumentation Engineers are able to:

1. Domain Knowledge: relate the fundamental concepts of Instrumentation (measurement, control, operation, monitoring and maintenance) to varied measurement systems and models.
2. Skill Set: design and develop automatic control system for the given specifications in the allied fields of engineering.
3. Adaptability: adapt and migrate to changing interdisciplinary technologies to provide improvised solutions.

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
506	18EI56	**VLSI Design**

Course outcomes of VLSI Design

Course Name : C506	Year: 2018-22
C506.1	Identify the CMOS layout levels, and the design layers used in the process sequence.
C506.2	Describe the general steps required for processing of CMOS integrated circuits.
C506.3	Design static CMOS combinational and sequential logic at the transistor level.
C506.4	Demonstrate different logic styles such as complementary CMOS logic, pass-transistor Logic, dynamic logic, etc.
C506.5	Interpret the need for testability and testing methods in VLSI.

CO-PO mapping (Correlation Mapping)

Course Name: C506												Year: 2018-22			
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C506.1	3	1										2	1	2	1
C506.2	3	3	1	2								2	1	1	1
C506.3	3	1	3	3	1							2	1	1	1
C506.4	2	2	1	2								2	1	2	2
C506.5	3	1	1	1								2	1	1	2
C506 (Avg.)	2.2	1.8	2.3	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	1.0	1.4	1.4

Course outcome Attainment:

Course outcome Attainment of VLSI Design (18E56)										Year: 2018-22
	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C506										

Course outcome Attainment of VLSI Design (18EI56)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C506							

CIE targets		SEE targets		
Below 45	0	0-4	<45	0
45-60	1	4.01-5.99	45-60	1
60-75	2	6.00-6.99	60-70	2
75 above	3	7 & above	70&above	3

Final PO Attainment

PO Attainment of VLSI Design (18EI56)														Year: 2018-22
Course Name	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS 02**	**PS03**
C505															

VLSI Design (18EI56) **Year: 2018-22**

ACTION/CONTINUOUS IMPROVEMENT PLANNED/ JUSTIFICATION

Action:

Improvement:

Mapping		Mapping Levels: (Low / Medium / High)	Justification
CO1	PO1	3	Acquire the knowledge on IC Techno1ogy
	PO2	1	Analysis of different types of IC fabrication methods.
	PO12	2	CMOS integrated circuits design technologies undergo wide technology changes. Extensive knowledge of the IC designs will make the student adaptable to the technological changes.
	PSO1	1	Solve problems to different CMOS layout levels by applying acquired knowledge.
	PSO2	2	Examine the relation between layout levels & design layers
	PSO3	2	Implement the basics of CMOS Layers in higher learning
CO2	PO1	3	Acquire knowledge on fundamental concepts of CMOS IC Processing steps. Understand its requirements. Learn the basics

			of CMOS IC technology.
	PO2	1	Analyze various fabrication methods.
	PO3	2	Project elucidations to problems faced during IC design.
	PO4	2	Solutions to problems in VLSI Processing.
	PO12	2	Knowledge of IC Design Era.
	PSO1	1	Analyse and design VLSI Deign processing methods
	PSO2	2	Apply efficient and optimised techniques in IC fabrication.
	PSO3	1	Develop schematic circuits for various combinational circuits
CO3	PO1	3	Acquire the knowledge on fundamental concepts of transistor level design requirements.
	PO2	1	Analysis of various configurations of combinational and Sequesntial circuits.
	PO3	3	Design solutions to problems using knowledge of nMOS & CMOS design technologies.
	PO4	3	Use the knowledge of technologies for developing solutions to complex combinational circuit problems
	PO12	2	Recognize the combinational & sequential circuits with logic design.
	PSO1	1	Solve problems to develop various ciruits by using pass transistors & transmission gates.
	PSO2	2	Examine the designs by Layout design rule checks
	PSO3	1	Implement the concepts of logical designs.
CO4	PO1	2	Knowledge of layer information &Stick diagrams are acquired.
	PO2	2	Understand and analyze the working of pass transistor Logic
	PO4	1	Use the knowledge of color codes to solve complex problems in CMOS & nMOS technologies.
	PO12	2	Apply the knowledge in recent trends in design of logics by using miniaturized design.
	PSO1	1	Interpretations of the systems are done with the acquired knowledge.
	PSO3	2	Different performance characteristics has to be analyzed for designing of circuits by using pass transistors, transmission gates & dynamic logic.
CO5	PO1	3	Acquire the knowledge of VLSI Design for testablility.
	PO2	1	Various testing methods in VLSI are analyzed with respect to changing parameters to produce engineering solutions
	PO3	1	Design a solution for given application using suitable for testability.
	PO4	1	Use the knowledge of VLSI testing principles to solve complex problems.
	PO12	2	Knowledge of Design Process-Computational Elements for complex engineering problems can be analyzed and interpreted.
	PSO1	1	Interpretations of the systems are done with the acquired knowledge.
	PSO2	1	Different performance characteristics has to be analyzed and

			utilized for by using CAD tools for design and simulation
	PSO3	2	Knowledge of practical aspects and testability is required to develop error free real time systems.

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
508	18EIL58	DIGITAL SIGNAL PROCESSING LAB

Course outcomes of DIGITAL SIGNAL PROCESSING LAB

Course Name : C508	Year: 2018-22
C508.1	Apply the concept of sampling an analog signal, and use it for real time applications
C508.2	Appreciate the concepts of convolution, correlation and apply it to solve practical problems
C508.3	Generate and compute discrete signals, apply FFT/DFT concepts to determine spectrum of a given signal
C508.4	Apply the basic filter concepts, design and evaluate different types of low pass and high pass filters.
C508.5	Design and demonstrate the DSP concepts, IIR and FIR filters using Matlab / Scilab/Octave programs and DSP Kit.

CO-PO mapping (Correlation Mapping)

Course Name: C508												Year: 2018-22			
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C508.1	3	3	3	2	2							2	3	1	2
C508.2	3	3	3	2	2							2	3	1	2
C508.3	3	3	3	2	2							2	3	1	2
C508.4	3	3	3	2	2							2	3	1	2
C508.5	3	3	3	2	3							2	3	1	2
C508 (Avg.)	3	3	3	2	2.2							2	3	1	2

Course outcome Attainment:

Course outcome Attainment of DIGITAL SIGNAL PROCESSING LAB (18EIL58) Year: 2018-22

Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C508	100	3	100	3	100	3	100	3	100	3

Course outcome Attainment of DIGITAL SIGNAL PROCESSING LAB (18EIL58)

Course Name	CIE*				SEE		Final attainment level
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C508	100	3			100	3	3

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of DIGITAL SIGNAL PROCESSING LAB (18EIL58)												Year: 2018-22		
Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS 02	PS03
C508	3	3	3	2	2.2							2	3	1	2

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
601	18EI61	Analog and Digital Communication Systems

Course outcomes of Analog and Digital Communication Systems

Course Name : C601	Year: 2018-22
C601.1	Analyse simple system for generation and detection of AM, DSB, SSB and VSB signals.
C601.2	Describe the concepts and performance of frequency modulation schemes.
C601.3	Explain the concepts of sampling theorem, and pulse modulation and demodulation techniques.
C601.4	Analyse systems for generation and detection of digital modulation systems and assess its performance.
C601.5	Describe the operation of WPAN technologies, protocols and cellular networks.

CO-PO mapping (Correlation Mapping)

Course Name: C601															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C601.1	3	3	2		2							2	3	2	3
C601.2	3	3	2		2							2	2	2	2
C601.3	3	3	2		2							3	2	2	2
C601.4	3	3	1		1							2	2	2	1
C601.5	3	2	1									2	2	2	1
C601 (Avg.)	3.0	2.8	1.6		1.4							2.2	2.2	2.0	1.8

Course outcome Attainment:

Course outcome Attainment of Analog and Digital Communication Systems (18EI61) Year: 2018-22										
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C601	100	3	100	3	100	3	100	3	100	3

Course outcome Attainment of Analog and Digital Communication Systems (18EI61)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	

C601	100	3	100	3	78	3	3

CIE targets		**SEE targets**	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of Analog and Digital Communication Systems (18EI61) Year: 2018-22														
Course Name	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS 02**	**PS03**
C601	**3.0**	**2.8**	**1.6**		**1.4**							**2.2**	**2.2**	**2.0**	**1.8**

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
643	18EI643	OPERATING SYSTEMS

Course outcomes of OPERATING SYSTEMS

Course Name : C643	**Year: 2018-22**
C643.1	Describe basic structure and functioning of OS and explain organization of computer system, and components, computing environments, network architectures, protocols and security & typical structure of OS.
C643.2	Analyze the process management, process scheduling, threads their issues and cpu scheduling algorithms
C643.3	Describe the concepts of process synchronization and analyze the problems of synchronization. Evaluate the cause and effect related to deadlocks, prevention and avoidance of the deadlocks
C643.4	Describe the techniques of memory management, virtual memory concepts, allocation and paging
C643.5	Apply appropriate disk scheduling algorithms. Describe the interfaces to file systems, file structure and implement file systems and directory structure

CO-PO mapping (Correlation Mapping)

Course Name: C643												**Year: 2018-22**			
COURSE OUTCOMES	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS O2**	**PS O3**
C643.1	3	2	1	1								2	2	1	2
C643.2	3	2	2	2								3	2	2	3
C643.3	3	2	2	2								3	2	2	3
C643.4	3	2	2	1								3	2	1	3
C643.5	3	2	2	2								2	2	1	2
C643 (Avg.)	3	2	1.8	1.6								2.6	2	1.4	2.6

Course outcome Attainment:Course outcome Attainment of OPERATING SYSTEMS (18EI643) Year: 2018-22

Course Name	**CO1**		**CO2**		**CO3**		**CO4**		**CO5**	
	%	**Level**	**%**	**Level**	**%**	**Level**	**%**	**Level**	**%**	**Level**
C643	100	3	100	3	100	3	100	3	100	3

Course outcome Attainment of OPERATING SYSTEMS (18EI643)							**Final attainment level**
Course Name	**CIE***				**SEE**		
	CO(%)	**Level (X1)**	**Q&A(%)**	**Level (X2)**	**SEE%**	**Level (X3)**	
C643	100	3	100	3	82.5	3	3

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of OPERATING SYSTEMS (18EI643)												Year: 2018-22			
Course Name	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS 02**	**PS03**
C643	3	2	1.8	1.6								2.6	2	1.4	2.6

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
501	18EI71	Automation in Process Control

Course outcomes of Automation in Process Control

Course Name : C701	Year: 2018-22
C701.1	Describe architecture, functioning and applications of PLC in automation and recognize various I/O modules of PLC.
C701.2	Apply programming concepts to interface peripherals and write ladder diagram program using different PLC instruction sets.
C701.3	Design Design and analyse the ladder diagram program using different PLC instruction sets for timer and counter modules.
C701.4	Discuss the various distributed control system and its architecture to develop an automation system.
C701.5	Analyse the basics of SCADA and communication protocols used in automation industries.

CO-PO mapping (Correlation Mapping)

Course Name: C505															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C701.1	3	3	2	2	3							3	3	2	3
C701.2	2	3	2	2	2							2	2	1	3
C701.3	3	2	3	2	2							3	3	2	2
C701.4	2	3	2	2	2							3	2	1	2
C701.5	3	2	2	2	2							3	3	1	3
C701 (Avg.)	2.6	2.6	2.2	2.0	2.2	0	0	0	0	0	0	2.8	2.6	1.4	2.6

Course outcome Attainment:

Course outcome Attainment of Automation in Process Control (18EI45)										Year: 2018-22
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C505										

Course outcome Attainment of Automation in Process Control (18EI45)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C505							

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of Automation in Process Control (18EI45) Year: 2018-22															
Course Name	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS 02**	**PS03**
C505															

Aeronautical Instrumentation (15EI552) **Year: 2015-19**

ACTION/CONTINUOUS IMPROVEMENT PLANNED/ JUSTIFICATION

Action:

Improvement:

Justification for Aeronautical Instrumentation (15EI552) year: 2015-19

CO/PO	CORRELATION	JUSTIFICATION
CO1-PO1	**3**	
CO2-PO2	**2**	
CO3-PO3	**1**	

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
702	18EI72	ARM PROCESSOR

Course outcomes of ARM Processor

Course Name: C702	Year: 2018-22
C702.1	Depict the organization, architecture, bus technology, memory and operation of the ARM processors
C702.2	Employ the knowledge of Instruction set of ARM processors to develop basic Assembly Language Programs
C702.3	Recognize the importance of the Thumb mode of operation of ARM processor and develop C programs for ARM processors
C702.4	Describe the techniques involved in Exception and Interrupt handling in ARM Processors and understand the fundamental concepts of Embedded Operating Systems
C702.5	Analyse the working of memory and memory management system to aid real time operating system.

CO-PO mapping (Correlation Mapping)

Course Name: C702															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C702.1	3	3	3	2	2							3	3	3	3
C702.2	3	3	3	2	2							3	2	3	3
C702.3	3	3	3	2	2							3	3	3	3
C702.4	3	2	3	2	2							3		3	3
C702.5	3	2	3									2		2	2
C702 (Avg.)	3.0	2.6	3.0	2.0	2.0							2.8	2.7	2.8	2.8

Course outcome Attainment:

Course outcome ARM PROCESSOR (18EI72)										Year: 2018-22
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C702	64	2	60	1	62	2	76	3	64	2

Course outcome Attainment of ARM PROCESSOR (18EI72)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C702	65	2	100	3	66.28	2	2

CIE targets		SEE targets		
Below 45	0	0-4	0	
45-60	1	4.01-5.99	1	
60-75	2	6.00-6.99	2	
75 above	3	7 & above	3	

Final PO Attainment

PO Attainment of ARM PROCESSOR (18EI72)											Year: 2018-22			
Course Name	**PO1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS0 2**	**PS03**
C702	2	1.73	2	1.33	1.33							1.86	1.8	1.86	1.86

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved, **VTU** Affiliated and **NAAC 'A'** Accredited)
(**UG programs** – CSE, ECE, ISE, EIE and EEE have been **Accredited** by **NBA** for the *Academic Years 2018-19, 2019-20, 2020-21 & 2021 -22*)
Channasandra, Dr. Vishnuvardhan Road, Bengaluru - 560 098

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
704	18EI744	Internet of Things

Course outcomes of Internet of Things

Course Name: C704	Year: 2018-22
C704.1	Interpret the impact and challenges posed by IoT networks leading to new architectural models.
C704.2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.
C704.3	Appraise the role of IoT protocols for efficient network communication.
C704.4	Elaborate the need for security in IoT.
C704.5	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in industry.

CO-PO mapping (Correlation Mapping)

Course Name: C704															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C704.1	3	3	3	2	2							3	3	3	3
C704.2	3	3	3	2	2							3	2	3	3
C704.3	3	3	3	2	2							3	3	3	3
C704.4	3	3	2	2	2	1		2				3	3	3	3
C704.5	3	3	3	2		2	2	1	1	1		3	3	2	2
C704 (Avg.)	3.0	3.0	2.8	2.0	2.0	1.5	2	1.5	1	1		3.0	2.8	2.8	2.8

Course Outcome Attainment:

Course outcome Internet of Things (18EI744)									Year: 2018-22	
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C704										

Course outcome Attainment of Internet of Things (18EI744)							Final attainment level
Course Name	CIE*				SEE		
	CO (%)	Level (X1)	Q&A (%)	Level (X2)	SEE%	Level (X3)	
C704							

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of Internet of Things (18EI744)										Year: 2018-22					
Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS 02	PS0 3
C704															

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
501	18EI81	Neural Networks and Fuzzy Logic System

Course outcomes of Neural Networks and Fuzzy Logic System

Course Name : C801	Year: 2018-22
C801.1	Discuss the single layer, multilayer network architecture and understanding the differences between biological neural network and ANN
C801.2	Analyze the ANN for pattern classification and learning algorithms
C801.3	Develop and configure ANNs with different types of learning algorithms for real world problems
C801.4	Discuss the fundamentals of fuzzy logic, implementation and their functions
C801.5	Apply fuzzy logic concepts in building automated control systems..
C801.5	Discuss the single layer, multilayer network architecture and understanding the differences between biological neural network and ANN

CO-PO mapping (Correlation Mapping)

Course Name: C505															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C801.1	3	3	3	2	2	1						3	1	2	3
C801.2	2	3	3	2	2	1						2	2	2	2
C801.3	2	2	2	3	2	1						3	1	3	3
C801.4	3	3	2	3	3	1						3	1	3	2
C801.5	3	2	3	3	2	1						3	1	2	2
C801 (Avg.)	2.6	2.6	2.6	2.6	2.2	1.0						2.8	1.2	2.4	2.4

Course outcome Attainment:

Course outcome Attainment of Neural Networks and Fuzzy Logic System (18EI81)Year: 2018-22										
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C801										

Course outcome Attainment of Neural Networks and Fuzzy Logic System (18EI81							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C801							

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of Neural Networks and Fuzzy Logic System (18EI81) Year: 2018-22															
Course Name	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS 02**	**PS03**
C505															

Aeronautical Instrumentation (15EI552) **Year: 2015-19**

ACTION/CONTINUOUS IMPROVEMENT PLANNED/ JUSTIFICATION

Action:

Improvement:

Justification for Aeronautical Instrumentation (15EI552) year: 2015-19

CO/PO	CORRELATION	JUSTIFICATION
CO1-PO1	**3**	
CO2-PO2	**2**	
CO3-PO3	**1**	

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
822	18EI822	Industrial Process Instrumentation

Course outcomes of Industrial Process Instrumentation (18EI822)

Course Name : C822	Year: 2018-22
	At the end of the course, the students are able to
C822.1	Sketch the typical instrumentation and control strategy in the process industries like paper, pulp, cement, power and steel plants.
C822.2	List the variable to be monitored and controlled in the above said process industries.
C822.3	Describe the instrumentation, control requirements and complete functioning of the above said industries.
C822.4	Analyze the hardware and software tools required for the above said process industries.
C822.5	Design and develop instrumentation and control strategy for simple process industry

CO-PO mapping (Correlation Mapping)

Course Name : Industrial Process Instrumentation (18EI822)															
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C822.1	3	3	1	2				2				3	3	1	2
C822.2	3	3	1	1				2				3	3	1	2
C822.3	3	3	1	1				3				3	3	1	2
C822.4	3	3	1	1				3				3	3	1	2
C822.5	3	3	2	1				3				3	3	1	2
C822 (Avg.)	3.0	3.0	1.2	1.2	0.0	0.0	0.0	2.6	0.0	0.0	0.0	3.0	3.0	1.0	2.0

Course outcome Attainment:

Course outcome Attainment of Industrial Process Instrumentation (18EI822)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C832							

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.75	1
60-75	2	5.76-6.75	2
75 above	3	6.75 & above	3

Final PO Attainment

PO Attainment of Industrial Process Instrumentation (18EI822) Year: 2018-22															
Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PS02	PS03
C832	3.0	3.0	1.2	1.2	0.0	0.0	0.0	2.6	0.0	0.0	0.0	3.0	3.0	1.0	2.0

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
601	18EIS84	Technical Seminar

Course outcomes of Technical Seminar

Course Name : C804	Year: 2018-22
C804.1	Develop knowledge in the field of Electronics & Instrumentation Engineering and other disciplines through independent learning and collaborative study.
C804.2	Identify and discuss the current, real-time issues and challenges in engineering & technology.
C804.3	Develop written and oral communication skills.
C804.4	Explore concepts in larger diverse social and academic contexts.
C804.5	Apply principles of ethics and develop the skills to enable life-long learning.

CO-PO mapping (Correlation Mapping)

Course Name: C804															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C804.1	3	2	1					1	2	3		3	2	2	3
C804.2	3	2	2					1	2	3		3	2	2	3
C804.3	3	2	1					1	2	3		3	2	1	2
C804.4	3	1	1					1	2	3		3	2	1	2
C804.5	3	2	2					1	2	1		3	2	2	3
C804 (Avg.)	3	1.8	1.4					1	2	2.6		3	2	1.6	2.6

Course outcome Attainment:

Course outcome Attainment of Technical Seminar (18EIS804)										Year: 2018-22
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C804										

Course outcome Attainment of Technical Seminar (18EIS84)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C804							

CIE targets		SEE targets	
Below 45	0	0-4	0
45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of Technical Seminar (18EIS84) Year: 2018-22														
Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS 02	PS03
C804															

Technical Seminar (18EIS84) **Year: 2018-22**

ACTION/CONTINUOUS IMPROVEMENT PLANNED/ JUSTIFICATION

Action:

Improvement:

Justification for Technical Seminar (18EIS84) year: 2018-22

CO/PO	CORRELATION	JUSTIFICATION
CO1-PO1	3	
CO2-PO2	2	
CO3-PO3	1	

Department of EIE

C No	SUBJECT CODE	SUBJECT NAME
501	18EI85	Internship / Professional Practice

Course outcomes of Internship / Professional Practice

Course Name : C101	Year: 2018-22
C805.1	Apply knowledge and skills learnt to acquire practical experience within industry in which the internship is done.
C805.2	Experience the activities, functions of professionals and develop oral and written communication skills.
C805.3	Recognize the areas for future knowledge and skill development.
C805.4	Acquire the basic knowledge of administration, marketing, finance and economics.
C805.5	Develop the skills to enable lifelong learning.

CO-PO mapping (Correlation Mapping)

Course Name: C805															Year: 2018-22
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C805.1	3	3	3	3	3			3	2	2	1	3	3	3	3
C805.2	3	2	1						3	3	3	3	1	1	3
C805.3	3	3	2	3	3			2		3	3	3	1	3	2
C805.4				2		2	1	3	3	3	3	3	1	2	3
C805.5	3	3	2	3	3			3	3	3	3	3	3	3	3
C505 (Avg.)	3.0	2.8	2.0	2.8	3.0	2.0	1.0	2.8	3.3	2.8	2.6	3.0	1.8	2.4	2.8

Course outcome Attainment:

Course outcome Attainment of Internship / Professional Practice (18EI85)										Year: 2018-22
Course Name	CO1		CO2		CO3		CO4		CO5	
	%	Level	%	Level	%	Level	%	Level	%	Level
C505										

Course outcome Attainment of Internship / Professional Practice (18EI85)							Final attainment level
Course Name	CIE*				SEE		
	CO(%)	Level (X1)	Q&A(%)	Level (X2)	SEE%	Level (X3)	
C505							

CIE targets		SEE targets	
Below 45	0	0-4	0

45-60	1	4.01-5.99	1
60-75	2	6.00-6.99	2
75 above	3	7 & above	3

Final PO Attainment

PO Attainment of Internship / Professional Practice (18EI85) Year: 2018-22															
Course Name	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS 02**	**PS03**
C505															

Aeronautical Instrumentation (15EI552) **Year: 2015-19**

ACTION/CONTINUOUS IMPROVEMENT PLANNED/ JUSTIFICATION

Action:

Improvement:

Justification for Aeronautical Instrumentation (15EI552) year: 2015-19

CO/PO	CORRELATION	JUSTIFICATION
CO1-PO1	**3**	
CO2-PO2	**2**	
CO3-PO3	**1**	

RNS INSTITUTE OF TECHNOLOGY, BENGALURU - 98
DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

Subject Code	Subject	Course Outcomes	Course Outcomes
15CS32	Analog And Digital Electronics	15CS32.1	Analyze the performance of transistors, operational amplifier circuits and their applications
		15CS32.2	Simplify the combinational logic circuits
		15CS32.3	Analyze and design the data processing circuits
		15CS32.4	Demonstrate the working of flip flops and registers
		15CS32.5	Analyze design and illustrate various types of counters
		15CS32.6	Analyze A/D and D/A converters and knowledge of logic design concepts to demonstrate various logic circuits using HDL.
15CS33	Data Structures and Applications	15CS33.1	Illustrate the knowledge of didderent types of data structres and its operations
		15CS33.2	Demonstrate the concepts of arraya and string operations
		15CS33.3	Implement and illustrate the operations of linear data structures
		15CS33.4	Demonstrate the operations of non linear data structures trees, graphs
		15CS33.5	Appy different techniques of sorting hashing and file structures concepts to solve appropriate problems
		15CS33.6	Design and apply appropriate data structures to solve various computing problems
15CS34	Computer Organization	15CS34.1	Demonstrate the knowledge of basic concepts of computer organization: structure and operations of computer and their peripherals
		15CS34.2	Design and develop programs as sequencs or subroutine using machine instruction
		15CS34.3	Illustrate different mode of communication with input ouput devices and standard i/o interfaces
		15CS34.4	Design and analyse heriachial memory system
		15CS34.5	Apply the arthemic and logical operations with integer and floating point operands
		15CS34.6	Demostrate the basic multiple bus organization, embedded system and multiprocessor
15CS35	Unix and Shell programming	15CS35.1	Acquire knowledge of various commands in unix operating system and its file system
		15CS35.2	Apply the knowledge of commands in executing the programs
		15CS35.3	Analyse and apply the concept in developing operating system
		15CS35.4	To provide a comprehensive introdution to shell programming service and utilities
		15CS35.5	To gaiing of important aspects related to the shell and the process
		15CS35.6	To deveol the ability to formulate regular expressions and use them for pattern matching
15CSL37	Analog and Digital Electronics Laboratory	15CSL37.1	Analyze and design various electronic circuits using electronic devices and components
		15CSL37.2	Construct and simultate the design of various analog using simulation packages like multisim
		15CSL37.3	Construct and implement various combinational circuits using digital trainer kit
		15CSL37.4	Construct and simulate the design of various digital circuits using simullation packages xilinx.
		15CSL37.5	Design develop and demonstrate various types of counters and registers using flip flops
		15CSL37.6	Design and develop digital to analog converter and demonstration the working of ALU

Subject Code	Subject	Course Outcomes	Course Outcomes
15CSL38	Data Structure Laboratory	15CSL38.1	Develop and execute programs to demonstrate the usage of basic C language constructs
		15CSL38.2	Develop, debug and demonstrate the operations of different types of linear data structures
		15CSL38.3	Implement the operations of different types of non- linear data structures.
		15CSL38.4	Apply and demonstrate the apllications of data structures
		15CSL38.5	Illustrate the working of files and hashing techniques.
		15CSL38.6	Apply appropriate data structures for solving real world problems and their applications
15CS42	Object oriented concepts	15CS42.1	Demonstrate the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects
		15CS42.2	Design and develop java application programs using OOP principles and proper program structure
		15CS42.3	Design and develop java programs using inheritance and exception handling mechanisms
		15CS42.4	Create java programs using packages interfaces and multithreaded concepts
		15CS42.5	Design and develop GUI for application programming using event handling and swings
		15CS42.6	Write java programs to solve rreal world problems
15CS43	Design and analysis of algorithms	15CS43.1	Create algorithms for different types of problems with the knowledge of basics, design specification performance analysis and associated data structures
		15CS43.2	Analyze the problem and identify the suitability of applying divide and conquer technique for solving the problems
		15CS43.3	Apply the greedy technique paradigm for obtaining best solution to the given problem
		15CS43.4	Design and develop an alogirthm using dynamic programming and analyze the time complexity
		15CS43.5	Devise algorithmfor problem solving using design strategies backtacking and branch and bound.
		15CS43.6	Analyze different types of computational problems classes and techniques to formulate the solutions to problems
15CS44	Microcontroller & Embedded System	15CS44.1	Illustarte the importance and applications of microprocessors and microcontrollers
		15CS44.2	Demonstrate the architecture and addressing modes of 8086 microprocessor
		15CS44.3	Develop assembly level programming with the knowledge of 8086 instructions
		15CS44.4	Illustrate the usage of BIOS and DOS interrupts in programming
		15CS44.5	Demonstrate memory design and interfacing hardware devices using interfacing device
		15CS44.6	Demonstrate the architecture of Arm processor and its instructions to write programs
15CS45	Software engineering	15CS45.1	Acquire knowledge to decompose the given project in various phases of a lifecycle
		15CS45.2	Apply the knowledge to choose appropriate process model depending on the user requirements
		15CS45.3	To perform various life cycle activities like analysis design implementation testin and maintenance
		15CS45.4	To know various processes used in all the phases of the product
		15CS45.5	To gain an understanding of important aspects related to the software engineering process
		15CS45.6	Apply the knowledge techniques and skills in the development of a software product

Subject Code	Subject	Course Outcomes	Course Outcomes
15CS46	Data Communication	15CS46.1	Demonstrate the basic concepts of computer networks and the working of physical layer.
		15CS46.2	Demonstrate the concepts of data and signal, data transmission, data conversion and switching model and solve revalent problems
		15CS46.3	Illustrate the various error detection and correction techniques and solve problems.
		15CS46.4	Analyze different error free transmission techniques.
		15CS46.5	Demonstrate Media access control protocols.
		15CS46.6	Identify and demonstrate the different network protocols for wired and wireless networks
15CSL47	Design and Analysis of Algorithm Laboratory	15CSL47.1	Demonstrate and implement programs using basic Java features and IDE tools.
		15CSL47.2	Develop programs to demonstrate the concepts of divide and conquer technique.
		15CSL47.3	Illustrate and implement algorithms for solving combinatorial problems and analyze time complexity.
		15CSL47.4	Illustrate and implement algorithms for solving graphically represented problems and analyze time complexity.
		15CSL47.5	Measure and compare the performance of a problem implemented using different algorithmic design techniques.Compare between them
		15CSL47.6	Analyse the timecomplexity of the algorithm implemented for the given problem statement.
15CSL48	Microcontroller & Embedded System Laboratory	15CSL48.1	Develop assembly programming using arithmetic and logical instructions
		15CSL48.2	Develop assembly programming using Load/store and branching instructions
		15CSL48.3	Develop embedded C programs to demonstrate the working of UART and motors
		15CSL48.4	Develop embedded C programs to demonstrate the working of DAC and ADC
		15CSL48.5	Develop embedded C programs to demonstrate the working of LCD and LED
		15CSL48.6	Conduct the real world experiments on an ARM7TDMI/LPC2148 evaluation board using evaluation version of embedded C & keil Uvision -4 tool/complier
15CS51	Management, Entrepreneurship for IT Industry	15CS51.1	Illustrate the basic principles and concepts of management, planning and organization.
		15CS51.2	Identify the purpose of staffing and interpret the concepts of directing and controlling.
		15CS51.3	Categorize the types and roles of an entrepreneur, along with identification of business opportunities.
		15CS51.4	Create the project report and perform the effective utilization of the resources through Enterprise Resource Planning.
		15CS51.5	Realize the need for small scale and micro industries.
		15CS51.6	Demonstrate the importance for entrepreneurship through case studies and Make use of IPRs and institutional support in entrepreneurship.
15CS52	Computer Networks	15CS52.1	Demonstrate the various application layer protocols
		15CS52.2	Apply the knowledge of concepts of transport layer
		15CS52.3	Apply the knowledge of concepts of network layer
		15CS52.4	Demonstrate the concepts of wireless networks
		15CS52.5	Demonstrate the concepts of multimedia data communication
		15CS52.6	Apply th eknowledge of computer networks and security to solve problems

Subject Code	Subject	Course Outcomes	Course Outcomes
15CS53	Data Base Management System	15CS53.1	Demonstrate the basics of database, data models and architecture.
		15CS53.2	Design ER Model for given case study.
		15CS53.3	Apply the basics of database and formulate the problems based on mathematical models using relational algebra concepts.
		15CS53.4	Formulate solutions to a given problem using Structured Query Language (SQL).
		15CS53.5	Analyze the applicapability of normalization level to a given problem in databases.
		15CS53.6	Demonstrate the knowledge of building applications to interact with databases, perform transactions, provide security and recovery protocols.
15CS54	Automata Theory and Computational intelligence	15CS54.1	Demonstrate the knowledge of core concepts in automata and theory of computation
		15CS54.2	Demonstrate the different formal language classes and their relationships
		15CS54.3	Solve problems related to conversion of different models of computation
		15CS54.4	Design grammars and recognizers for different formal languages
		15CS54.5	Illustarte theorems in automata theory using appropriate properties
		15CS54.6	Determine the decidability and intractability of computational problems using turning machines
15CS553	ADVANCED JAVA AND J2EE	15CS53.1	Apply the concepts of enumerations auto boxing and annotations in java programs
		15CS53.2	Design java application to demonstrate the usage of collection framework
		15CS53.3	Implement java programs by applying the concepts of string class and its methods
		15CS53.4	Write web applications using servlets and JSPs in Tomcat environment
		15CS53.5	Create JDBC connection for any real time database applications using java programming
		15CS53.6	Write java application to solve real world problems
15CS562	ARTIFICIAL INTELLIGENCE	15CS562.1	Analysine and formalise the real worl problem as a stste space , graph, design heurstic and select amongst different search or game hand technique to solve them
		15CS562.2	Attain the capability to represent and solve various real life problem using logic-based techniques and use this so perform inference or reasoning
		15CS562.3	Formulate and solve problems with certain and uncertain information using bayesian approches and semantic nets and frames
		15CS562.4	Apply the concept of CDs and scripts to represent knowledge, solve game problems using game playing techniques
		15CS562.5	Demonstrate appropriate learning algorithms, natural languages processing to problem leading to understanding of cognitive computing and expert systems
		15CS562.6	Solve problems related to various domains of AI
15CSL57	Computer Network Laboratory	15CSL57.1	Develop programs to demonstaret the communication for wired networks using NS-3 simulator
		15CSL57.2	Develop programs to demonstaret the communication for wireless networks using NS-3 simulator
		15CSL57.3	Develop programs to related to data integrity and security
		15CSL57.4	Create programs to transfer data using TCP and UDP transport layer prorocols
		15CSL57.5	Develop programs to find the shortest path using routing alogorithms
		15CSL57.6	Develop programs to avoid congestion in the network

Subject Code	Subject	Course Outcomes	Course Outcomes
15CSL58	DBMS Laboratory with mini project	15CSL58.1	Design ER diagram, relational schema and develop database for a given problem and perform operations using simple SQL queries.
		15CSL58.2	Create ER diagram, relational schema and develop database for a given problem using SET and DELETE operation.
		15CSL58.3	Design ER diagram, relational schema and develop database for a given problem using JOIN operation and eliminate redundancies.
		15CSL58.4	Create ER diagram, relational schema and develop database for a given problem using nested and co-related queries
		15CSL58.5	Design and develop a mini-project for real world application using suitable DBMS.
		15CSL58.6	Apply the knowledge of Java/ PHP / C# / Python / any other front end tool to build a GUI to store, retrieve and manipulate data.
15CS61	CRYPTOGRAPHY NETWORK SECURITY AND CYBER LAW	15CS61.1	Demonstrate the basics of cyber attacks and solve the problems related to cryptography
		15CS61.2	Apply the concepts of cryptographic algorithms to solve problems
		15CS61.3	Illustrate algorithms used to provide confidentiality integrity and authentication
		15CS61.4	Demonstarte the various key distribution and management schemes
		15CS61.5	Demonstrate the concepts of wireless LAN security
		15CS61.6	Demonstrate the cyber laws and ethics o be followed
15IS62	FILE STRUCTURES	15IS62.1	Demonstaret the fundamentals concepts of file processing operations
		15IS62.2	Apply the appropriate file structures for data storage
		15IS62.3	Apply suitable sorting techniques to sort large data stored in multiple files
		15IS62.4	Analyze a suitable indexing techniques to achieve fast retrieval for a given problem
		15IS62.5	Apply a suitable hashing techniques for storage and retrieval of records for a given problem
		15IS62.6	Implement different technigues of file processing with appropriate programming language
15IS63	SOFTWARE TESTING	15IS63.1	Demonstrate the different testing approches testing attributes test metrics and examples
		15IS63.2	Analyze different testing techniques and derive test cases for any given problem
		15IS63.3	Apply suitable testing model to a given problem
		15IS63.4	Demonstarte system integration and interaction testing with examples
		15IS63.5	Demonstaret basic principles dependability properties to test the quality of the software
		15IS63.6	Create test execution through manual testing and tools documentation and analysis of reports planning and monitoring
15CS64	OPERATING SYSTEMS	15CS64.1	To acquire knowledge provided by the design of an operating system
		15CS64.2	To understand the structure and organization of the file system
		15CS64.3	To understand what a process is and how proceses are synchronized and scheduled
		15CS64.4	To understand different approches to memory management
		15CS64.5	To understanding of important aspects related to system calls for managing processes, memor and the file system
		15CS64.6	To undersatand the data structures and algorithms used to implement an OS

Subject Code	Subject	Course Outcomes	Course Outcomes
15CS651	DATA MINING AND DATA WAREHOUSING	15CS651.1	Demonstarte the functionality of the various concepts of data warehouse concepts
		15CS651.1	Implementation of data warehouse and data mining concepts
		15CS651.1	Analyse and solve problems related to association rules
		15CS651.1	Apply and evaluate classification techniques
		15CS651.1	Analyze and apply different Clustering algorithms
		15CS651.1	Implement data warehouse and apply data mining techniques to solve real world arises problems
15CS653	OPERATIONS RESEARCH	15CS653.1	Develop operational research models from the verbal description for the real world problems
		15CS653.2	Apply graphical method for linear programming problems to get optimized solution
		15CS653.3	Solve linear programming problems using different techniques like simplex method big M, 2-phase and duality theory
		15CS653.4	Find the initial and optimal solution to the transportation and assignment model using different methods
		15CS653.5	Solve problems of decision support systems using game theory concepts
		15CS653.6	Solve the problems related to the usage of metaheuristic techniques to find the nearest optima solutions
15CS664	PYTHON APPLICATION PROGRAMMING	15CS664.1	Apply python syntax, sematics, python flow control statements and functions in programming
		15CS664.2	Demonstarte the knowledge of handling strings and file systems in programs
		15CS664.3	Develop the python programs using core data structures like lists, dictionaries and tuples
		15CS664.4	Build regular expressions for pattern matching in python
		15CS664.5	Interpret the concepts of objec oriented programming used in python
		15CS664.6	Implement applications related to network programming web services and datatbases in python
15ISL67	SOFTWARE TESTING LAB	15ISL67.1	Apply the knowledge pfidenfitying specification requirements, develping code and derive test cases for any problem using boundary value analysis method.
		15ISL67.2	Derive the test cases for any problem using equivalance class testing method
		15ISL67.3	Derive the test cases for any problem using decision table approach
		15ISL67.4	Design and consuct program graph and derive test cases for any given problem using path testing
		15ISL67.5	Design and consuct program graph and derive test cases for any given problem using data flow testing
		15ISL67.6	Demonstate study experiment problems with any of the testing method
15ISL68	FILE STRUCTURES LAB WITH MINI PROJECT	15ISL68.1	Solve the problem using fundemental file operation
		15ISL68.2	Apply the appropriate fields and record structure to store data and perform operations on files
		15ISL68.3	Design an appropriate simple indexing technique to demonstrate efficient retrieval of data
		15ISL68.4	Demonstrate and write a program for co-sequencial processing of large file
		15ISL68.5	Create appropriate indenxing structure to store and retrive data from files
		15ISL68.6	Design and develop a mini project to demonstrate various operations on files and indexing techniques

Subject Code	Subject	Course Outcomes	Course Outcomes
15CS71	WEB TECHNOLOGY AND ITS APPLICATIONS	15CS71.1	Design structured and semantic web pages using HTML and CSS
		15CS71.2	Modify the format of tables and forms in web pages using HTML and CSS properties
		15CS71.3	Combine javascript to web pages as client side script to add dynamic contents
		15CS71.4	Apply PHP as a server side script to make web pages more responsive
		15CS71.5	Apply object oriented principles for web development using PHP
		15CS71.6	Utilize javascript frameworks that follows MVC pardigm to design application and develop client server communication model using XML
15CS72	SOFTWARE ARCHUTECTURE AND DESIGN PATTERNS	15CS72.1	Demonstrate the fundementals of design patters
		15CS72.2	Analyze a case study to gather requirements, design and implement the system
		15CS72.3	Illustrate Structural patterns like adopter, bridge, composite, etc
		15CS72.4	Design and implement interactive systems using MVC architecture
		15CS72.5	Implement a distributed object-oriented application
		15CS72.6	Apply suitable pattern for a given problem
15CS73	MACHINE LEARNING	15CS73.1	Undertand the basic concepts of Hypothesis
		15CS73.2	Discuss about concept learning tasks with examples
		15CS73.3	Apply decision tree concepts on various data sets
		15CS73.4	Understand the concepts of artificial neural networks
		15CS73.5	Analyse Bayesian Learning algorithm to classify different data sets
		15CS73.6	Evaluate Hypothesis and instance based learning with different algorithms
15CS742	CLOUD COMPUTING AND ITS APPLICATIONS	15CS742.1	Demonstrate the specific challenges, issues and technologies in cloud computing.
		15CS742.2	Illustrate the cloud computing architecture and its applications
		15CS742.3	Demonstrate the concepts of thread programming and high throughput computing
		15CS742.4	Illustrate the concept of data intensive comuting with applications
		15CS742.5	Demonstrate the cloud platforms and its scientific applications in industries
		15CS742.6	Analyse the cloud computing services, virtualisation and its applications
15CS754	STORAGE AREA NETWORK	15CS754.1	Demonsrate the storage area networks chareceristics, components and storage architechtures and solve problems
		15CS754.1	Illustrate the concept of RAID and their suitablity for different application environments and solve problems
		15CS754.2	Demonstrate file sharing operations on NAS and IP-SAN of the different netowrks and concepts of business continuity and disaster recovery in a storage infrastructure
		15CS754.3	Demonstrate the working of storate virtualisation on various levels of storage
		15CS754.4	Illustrate the concepts of cloud computing
		15CS754.5	Demonstrate the Knowledge of securing the local replication in Storage Infrastructure

Subject Code	Subject	Course Outcomes	Course Outcomes
15CSL76	MACHINE LEARNING LABORATORY	15CSL76.1	Understand the basic concepts of Hypothesis in Machine learning
		15CSL76.2	Apply decision tree learning for data sets
		15CSL76.3	Solve the problem related to artificial neural networks
		15CSL76.4	Analyse Bayesian learning algorithm with difference data set
		15CSL76.5	Evaluating Hypothesis and instance based learning with different algorithms
		15CSL76.6	Apply machine learning techniques for real world data
15CSL77	Web Technology Lab with Mini-project	15CSL77.1	Design and develop dynamic web pages using HTML and javascript
		15CSL77.2	Create XML documents to store and transport data
		15CSL77.3	Build dynamic and interactive web pages using PHP scripts
		15CSL77.4	Combine web technologies with database and perform various operations on database
		15CSL77.5	Build responsive applications using current tools and frameworks
		15CSL77.6	Design and devlop web sites as mini project and host them
15IS81	INTERNET OF THINGS AND ITS APPLICATION	15IS81.1	Interpret the impact and challenges posed by IoT networks leading to new architectural models.
		15IS81.2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.
		15IS81.3	Compare different Application protocols for IoT.
		15IS81.4	Elaborate the need for Data Analytics and Security in IoT.
		15IS81.5	Design and Develop programs using Arduino and Raspberry Pi board to interface with various sensors.
		15IS81.6	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.
15CS82	BIG DATA ANALYTICS	15CS82.1	Master the concepts of HDFS and MapReduce framework
		15CS82.2	Investigate Hadoop related tools for big data analytics and perform basic Hadoop administration
		15CS82.3	Recognise the role of Business Intelligence, data warehousing and visualisation in decision making
		15CS82.4	Infer the inportatance of core data mining techiques for data analytics
		15CS82.5	Compare and contrast different Text Mining techiques
		15CS82.6	Illustrate real world applications based on MapReduce programming using big data analytics
15CS834	SYSTEM MODELLING AND SIMULATION	15CS834.1	Understanding simulation and its types with examples
		15CS834.2	Review on basics concepts and types of models
		15CS834.3	Problem soving using random number generation and random variates
		15CS834.4	Estimating the output performance of model using different types of test
		15CS834.5	Verification and validation of the model
		15CS834.6	Apply simulation for real time problem

Subject Code	Subject	Course Outcomes	Course Outcomes
17CS32	Analog And Digital Electronics	17CS32.1	Analyze the performance of transistors, operational amplifier circuits and their applications
		17CS32.2	Simplify the combinational logic circuits
		17CS32.3	Analyze and design the data processing circuits
		17CS32.4	Demonstrate the working of flip flops and registers
		17CS32.5	Analyze design and illustrate various types of counters
		17CS32.6	Analyze A/D and D/A converters and knowledge of logic design concepts to demonstrate various logic circuits using HDL.
17CS33	Data Structures and Applications	17CS33.1	Illustrate the knowledge of didderent types of data structres and its operations
		17CS33.2	Demonstrate the concepts of arraya and string operations
		17CS33.3	Implement and illustrate the operations of linear data structures
		17CS33.4	Demonstrate the operations of non linear data structures trees, graphs
		17CS33.5	Appy different techniques of sorting hashing and file structures concepts to solve appropriate problems
		17CS33.6	Design and apply appropriate data structures to solve various computing problems
17CS34	Computer Organization	17CS34.1	Demonstrate the knowledge of basic concepts of computer organization: structure and operations of computer and their peripherals
		17CS34.2	Design and develop programs as sequencs or subroutine using machine instruction
		17CS34.3	Illustrate different mode of communication with input ouput devices and standard i/o interfaces
		17CS34.4	Design and analyse heriachial memory system
		17CS34.5	Apply the arthemic and logical operations with integer and floating point operands
		17CS34.6	Demostrate the basic multiple bus organization, embedded system and multiprocessor
17CS35	Unix and Shell programming	17CS35.1	Acquire knowledge of various commands in unix operating system and its file system
		17CS35.2	Apply the knowledge of commands in executing the programs
		17CS35.3	Analyse and apply the concept in developing operating system
		17CS35.4	To provide a comprehensive introdution to shell programming service and utilities
		17CS35.5	To gaiing of important aspects related to the shell and the process
		17CS35.6	To deveol the ability to formulate regular expressions and use them for pattern matching
17CSL37	Analog and Digital Electronics Laboratory	17CSL37.1	Analyze and design various electronic circuits using electronic devices and components
		17CSL37.2	Construct and simultate the design of various analog using simulation packages like multisim
		17CSL37.3	Construct and implement various combinational circuits using digital trainer kit
		17CSL37.4	Construct and simulate the design of various digital circuits using simullation packages xilinx.
		17CSL37.5	Design develop and demonstrate various types of counters and registers using flip flops
		17CSL37.6	Design and develop digital to analog converter and demonstration the working of ALU

Subject Code	Subject	Course Outcomes	Course Outcomes
17CSL38	Data Structure Laboratory	17CSL38.1	Develop and execute programs to demonstrate the usage of basic C language constructs
		17CSL38.2	Develop, debug and demonstrate the operations of different types of linear data structures
		17CSL38.3	Implement the operations of different types of non- linear data structures.
		17CSL38.4	Apply and demonstrate the apllications of data structures
		17CSL38.5	Illustrate the working of files and hashing techniques.
		17CSL38.6	Apply appropriate data structures for solving real world problems and their applications
17CS42	Object oriented concepts	17CS42.1	Demonstrate the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects
		17CS42.2	Design and develop java application programs using OOP principles and proper program structure
		17CS42.3	Design and develop java programs using inheritance and exception handling mechanisms
		17CS42.4	Create java programs using packages interfaces and multithreaded concepts
		17CS42.5	Design and develop GUI for application programming using event handling and swings
		17CS42.6	Write java programs to solve rreal world problems
17CS43	Design and analysis of algorithms	17CS43.1	Create algorithms for different types of problems with the knowledge of basics, design specification performance analysis and associated data structures
		17CS43.2	Analyze the problem and identify the suitability of applying divide and conquer technique for solving the problems
		17CS43.3	Apply the greedy technique paradigm for obtaining best solution to the given problem
		17CS43.4	Design and develop an alogirthm using dynamic programming and analyze the time complexity
		17CS43.5	Devise algorithmfor problem solving using design strategies backtacking and branch and bound.
		17CS43.6	Analyze different types of computational problems classes and techniques to formulate the solutions to problems
17CS44	Microcontroller & Embedded System	17CS44.1	Illustarte the importance and applications of microprocessors and microcontrollers
		17CS44.2	Demonstrate the architecture and addressing modes of 8086 microprocessor
		17CS44.3	Develop assembly level programming with the knowledge of 8086 instructions
		17CS44.4	Illustrate the usage of BIOS and DOS interrupts in programming
		17CS44.5	Demonstrate memory design and interfacing hardware devices using interfacing device
		17CS44.6	Demonstrate the architecture of Arm processor and its instructions to write programs
17CS45	Software engineering	17CS45.1	Acquire knowledge to decompose the given project in various phases of a lifecycle
		17CS45.2	Apply the knowledge to choose appropriate process model depending on the user requirements
		17CS45.3	To perform various life cycle activities like analysis design implementation testin and maintenance
		17CS45.4	To know various processes used in all the phases of the product
		17CS45.5	To gain an understanding of important aspects related to the software engineering process
		17CS45.6	Apply the knowledge techniques and skills in the development of a software product

Subject Code	Subject	Course Outcomes	Course Outcomes
17CS46	Data Communication	17CS46.1	Demonstrate the basic concepts of computer networks and the working of physical layer.
		17CS46.2	Demonstrate the concepts of data and signal, data transmission, data conversion and switching model and solve revalent problems
		17CS46.3	Illustrate the various error detection and correction techniques and solve problems.
		17CS46.4	Analyze different error free transmission techniques.
		17CS46.5	Demonstrate Media access control protocols.
		17CS46.6	Identify and demonstrate the different network protocols for wired and wireless networks
17CSL47	Design and Analysis of Algorithm Laboratory	17CSL47.1	Demonstrate and implement programs using basic Java features and IDE tools.
		17CSL47.2	Develop programs to demonstrate the concepts of divide and conquer technique.
		17CSL47.3	Illustrate and implement algorithms for solving combinatorial problems and analyze time complexity.
		17CSL47.4	Illustrate and implement algorithms for solving graphically represented problems and analyze time complexity.
		17CSL47.5	Measure and compare the performance of a problem implemented using different algorithmic design techniques.Compare between them
		17CSL47.6	Analyse the timecomplexity of the algorithm implemented for the given problem statement.
17CSL48	Microcontroller & Embedded System Laboratory	17CSL48.1	Develop assembly programming using arithmetic and logical instructions
		17CSL48.2	Develop assembly programming using Load/store and branching instructions
		17CSL48.3	Develop embedded C programs to demonstrate the working of UART and motors
		17CSL48.4	Develop embedded C programs to demonstrate the working of DAC and ADC
		17CSL48.5	Develop embedded C programs to demonstrate the working of LCD and LED
		17CSL48.6	Conduct the real world experiments on an ARM7TDMI/LPC2148 evaluation board using evaluation version of embedded C & keil Uvision -4 tool/complier
17CS51	Management, Entrepreneurship for IT Industry	17CS51.1	Illustrate the basic principles and concepts of management, planning and organization.
		17CS51.2	Identify the purpose of staffing and interpret the concepts of directing and controlling.
		17CS51.3	Categorize the types and roles of an entrepreneur, along with identification of business opportunities.
		17CS51.4	Create the project report and perform the effective utilization of the resources through Enterprise Resource Planning.
		17CS51.5	Realize the need for small scale and micro industries.
		17CS51.6	Demonstrate the importance for entrepreneurship through case studies and Make use of IPRs and institutional support in entrepreneurship.
17CS52	Computer Networks	17CS52.1	Demonstrate the various application layer protocols
		17CS52.2	Apply the knowledge of concepts of transport layer
		17CS52.3	Apply the knowledge of concepts of network layer
		17CS52.4	Demonstrate the concepts of wireless networks
		17CS52.5	Demonstrate the concepts of multimedia data communication
		17CS52.6	Apply th eknowledge of computer networks and security to solve problems

Subject Code	Subject	Course Outcomes	Course Outcomes
17CS53	Data Base Management System	17CS53.1	Demonstrate the basics of database, data models and architecture.
		17CS53.2	Design ER Model for given case study.
		17CS53.3	Apply the basics of database and formulate the problems based on mathematical models using relational algebra concepts.
		17CS53.4	Formulate solutions to a given problem using Structured Query Language (SQL).
		17CS53.5	Analyze the applicapability of normalization level to a given problem in databases.
		17CS53.6	Demonstrate the knowledge of building applications to interact with databases, perform transactions, provide security and recovery protocols.
17CS54	Automata Theory and Computational intelligence	17CS54.1	Demonstrate the knowledge of core concepts in automata and theory of computation
		17CS54.2	Demonstrate the different formal language classes and their relationships
		17CS54.3	Solve problems related to conversion of different models of computation
		17CS54.4	Design grammars and recognizers for different formal languages
		17CS54.5	Illustarte theorems in automata theory using appropriate properties
		17CS54.6	Determine the decidability and intractability of computational problems using turning machines
17CS553	ADVANCED JAVA AND J2EE	17CS53.1	Apply the concepts of enumerations auto boxing and annotations in java programs
		17CS53.2	Design java application to demonstrate the usage of collection framework
		17CS53.3	Implement java programs by applying the concepts of string class and its methods
		17CS53.4	Write web applications using servlets and JSPs in Tomcat environment
		17CS53.5	Create JDBC connection for any real time database applications using java programming
		17CS53.6	Write java application to solve real world problems
17CS562	ARTIFICIAL INTELLIGENCE	17CS562.1	Analysine and formalise the real worl problem as a stste space , graph, design heurstic and select amongst different search or game hand technique to solve them
		17CS562.2	Attain the capability to represent and solve various real life problem using logic-based techniques and use this so perform inference or reasoning
		17CS562.3	Formulate and solve problems with certain and uncertain information using bayesian approches and semantic nets and frames
		17CS562.4	Apply the concept of CDs and scripts to represent knowledge, solve game problems using game playing techniques
		17CS562.5	Demonstrate appropriate learning algorithms, natural languages processing to problem leading to understanding of cognitive computing and expert systems
		17CS562.6	Solve problems related to various domains of AI
17CSL57	Computer Network Laboratory	17CSL57.1	Develop programs to demonstaret the communication for wired networks using NS-3 simulator
		17CSL57.2	Develop programs to demonstaret the communication for wireless networks using NS-3 simulator
		17CSL57.3	Develop programs to related to data integrity and security
		17CSL57.4	Create programs to transfer data using TCP and UDP transport layer prorocols
		17CSL57.5	Develop programs to find the shortest path using routing alogorithms
		17CSL57.6	Develop programs to avoid congestion in the network

Subject Code	Subject	Course Outcomes	Course Outcomes
17CSL58	DBMS Laboratory with mini project	17CSL58.1	Design ER diagram, relational schema and develop database for a given problem and perform operations using simple SQL queries.
		17CSL58.2	Create ER diagram, relational schema and develop database for a given problem using SET and DELETE operation.
		17CSL58.3	Design ER diagram, relational schema and develop database for a given problem using JOIN operation and eliminate redundancies.
		17CSL58.4	Create ER diagram, relational schema and develop database for a given problem using nested and co-related queries
		17CSL58.5	Design and develop a mini-project for real world application using suitable DBMS.
		17CSL58.6	Apply the knowledge of Java/ PHP / C# / Python / any other front end tool to build a GUI to store, retrieve and manipulate data.
17CS61	CRYPTOGRAPHY NETWORK SECURITY AND CYBER LAW	17CS61.1	Demonstrate the basics of cyber attacks and solve the problems related to cryptography
		17CS61.2	Apply the concepts of cryptographic algorithms to solve problems
		17CS61.3	Illustrate algorithms used to provide confidentiality integrity and authentication
		17CS61.4	Demonstarte the various key distribution and management schemes
		17CS61.5	Demonstrate the concepts of wireless LAN security
		17CS61.6	Demonstrate the cyber laws and ethics o be followed
17IS62	FILE STRUCTURES	17IS62.1	Demonstaret the fundamentals concepts of file processing operations
		17IS62.2	Apply the appropriate file structures for data storage
		17IS62.3	Apply suitable sorting techniques to sort large data stored in multiple files
		17IS62.4	Analyze a suitable indexing techniques to achieve fast retrieval for a given problem
		17IS62.5	Apply a suitable hashing techniques for storage and retrieval of records for a given problem
		17IS62.6	Implement different technigues of file processing with appropriate programming language
17IS63	SOFTWARE TESTING	17IS63.1	Demonstrate the different testing approches testing attributes test metrics and examples
		17IS63.2	Analyze different testing techniques and derive test cases for any given problem
		17IS63.3	Apply suitable testing model to a given problem
		17IS63.4	Demonstarte system integration and interaction testing with examples
		17IS63.5	Demonstaret basic principles dependability properties to test the quality of the software
		17IS63.6	Create test execution through manual testing and tools documentation and analysis of reports planning and monitoring
17CS64	OPERATING SYSTEMS	17CS64.1	To acquire knowledge provided by the design of an operating system
		17CS64.2	To understand the structure and organization of the file system
		17CS64.3	To understand what a process is and how proceses are synchronized and scheduled
		17CS64.4	To understand different approches to memory management
		17CS64.5	To understanding of important aspects related to system calls for managing processes, memor and the file system
		17CS64.6	To undersatand the data structures and algorithms used to implement an OS

Subject Code	Subject	Course Outcomes	Course Outcomes
17CS651	DATA MINING AND DATA WAREHOUSING	17CS651.1	Demonstarte the functionality of the various concepts of data warehouse concepts
		17CS651.1	Implementation of data warehouse and data mining concepts
		17CS651.1	Analyse and solve problems related to association rules
		17CS651.1	Apply and evaluate classification techniques
		17CS651.1	Analyze and apply different Clustering algorithms
		17CS651.1	Implement data warehouse and apply data mining techniques to solve real world arises problems
17CS653	OPERATIONS RESEARCH	17CS653.1	Develop operational research models from the verbal description for the real world problems
		17CS653.2	Apply graphical method for linear programming problems to get optimized solution
		17CS653.3	Solve linear programming problems using different techniques like simplex method big M, 2-phase and duality theory
		17CS653.4	Find the initial and optimal solution to the transportation and assignment model using different methods
		17CS653.5	Solve problems of decision support systems using game theory concepts
		17CS653.6	Solve the problems related to the usage of metaheuristic techniques to find the nearest optima solutions
17CS664	PYTHON APPLICATION PROGRAMMING	17CS664.1	Apply python syntax, sematics, python flow control statements and functions in programming
		17CS664.2	Demonstarte the knowledge of handling strings and file systems in programs
		17CS664.3	Develop the python programs using core data structures like lists, dictionaries and tuples
		17CS664.4	Build regular expressions for pattern matching in python
		17CS664.5	Interpret the concepts of objec oriented programming used in python
		17CS664.6	Implement applications related to network programming web services and datatbases in python
17ISL67	SOFTWARE TESTING LAB	17ISL67.1	Apply the knowledge pfidenfitying specification requirements, develping code and derive test cases for any problem using boundary value analysis method.
		17SL67.2	Derive the test cases for any problem using equivalance class testing method
		17ISL67.3	Derive the test cases for any problem using decision table approach
		17ISL67.4	Design and consuct program graph and derive test cases for any given problem using path testing
		17ISL67.5	Design and consuct program graph and derive test cases for any given problem using data flow testing
		17ISL67.6	Demonstate study experiment problems with any of the testing method
17ISL68	FILE STRUCTURES LAB WITH MINI PROJECT	17ISL68.1	Solve the problem using fundemental file operation
		17ISL68.2	Apply the appropriate fields and record structure to store data and perform operations on files
		17ISL68.3	Design an appropriate simple indexing technique to demonstrate efficient retrieval of data
		17ISL68.4	Demonstrate and write a program for co-sequencial processing of large file
		17ISL68.5	Create appropriate indenxing structure to store and retrive data from files
		17ISL68.6	Design and develop a mini project to demonstrate various operations on files and indexing techniques

Subject Code	Subject	Course Outcomes	Course Outcomes
17CS71	WEB TECHNOLOGY AND ITS APPLICATIONS	17CS71.1	Design structured and semantic web pages using HTML and CSS
		17CS71.2	Modify the format of tables and forms in web pages using HTML and CSS properties
		17CS71.3	Combine javascript to web pages as client side script to add dynamic contents
		17CS71.4	Apply PHP as a server side script to make web pages more responsive
		17CS71.5	Apply object oriented principles for web development using PHP
		17CS71.6	Utilize javascript frameworks that follows MVC pardigm to design application and develop client server communication model using XML
17CS72	SOFTWARE ARCHUTECTURE AND DESIGN PATTERNS	17CS72.1	Demonstrate the fundementals of design patters
		17CS72.2	Analyze a case study to gather requirements, design and implement the system
		17CS72.3	Illustrate Structural patterns like adopter, bridge, composite, etc
		17CS72.4	Design and implement interactive systems using MVC architecture
		17CS72.5	Implement a distributed object-oriented application
		17CS72.6	Apply suitable pattern for a given problem
17CS73	MACHINE LEARNING	17CS73.1	Undertand the basic concepts of Hypothesis
		17CS73.2	Discuss about concept learning tasks with examples
		17CS73.3	Apply decision tree concepts on various data sets
		17CS73.4	Understand the concepts of artificial neural networks
		17CS73.5	Analyse Bayesian Learning algorithm to classify different data sets
		17CS73.6	Evaluate Hypothesis and instance based learning with different algorithms
17CS742	CLOUD COMPUTING AND ITS APPLICATIONS	17CS742.1	Demonstrate the specific challenges, issues and technologies in cloud computing.
		17CS742.2	Illustrate the cloud computing architecture and its applications
		17CS742.3	Demonstrate the concepts of thread programming and high throughput computing
		17CS742.4	Illustrate the concept of data intensive comuting with applications
		17CS742.5	Demonstrate the cloud platforms and its scientific applications in industries
		17CS742.6	Analyse the cloud computing services, virtualisation and its applications
17CS754	STORAGE AREA NETWORK	17CS754.1	Demonsrate the storage area networks chareceristics, components and storage architechtures and solve problems
		17CS754.1	Illustrate the concept of RAID and their suitablity for different application environments and solve problems
		17CS754.2	Demonstrate file sharing operations on NAS and IP-SAN of the different netowrks and concepts of business continuity and disaster recovery in a storage infrastructure
		17CS754.3	Demonstrate the working of storate virtualisation on various levels of storage
		17CS754.4	Illustrate the concepts of cloud computing
		17CS754.5	Demonstrate the Knowledge of securing the local replication in Storage Infrastructure

Subject Code	Subject	Course Outcomes	Course Outcomes
17CSL76	MACHINE LEARNING LABORATORY	17CSL76.1	Understand the basic concepts of Hypothesis in Machine learning
		17CSL76.2	Apply decision tree learning for data sets
		17CSL76.3	Solve the problem related to artificial neural networks
		17CSL76.4	Analyse Bayesian learning algorithm with difference data set
		17CSL76.5	Evaluating Hypothesis and instance based learning with different algorithms
		17CSL76.6	Apply machine learning techniques for real world data
17CSL77	Web Technology Lab with Mini-project	17CSL77.1	Design and develop dynamic web pages using HTML and javascript
		17CSL77.2	Create XML documents to store and transport data
		17CSL77.3	Build dynamic and interactive web pages using PHP scripts
		17CSL77.4	Combine web technologies with database and perform various operations on database
		17CSL77.5	Build responsive applications using current tools and frameworks
		17CSL77.6	Design and devlop web sites as mini project and host them
17IS81	INTERNET OF THINGS AND ITS APPLICATION	17IS81.1	Interpret the impact and challenges posed by IoT networks leading to new architectural models.
		17IS81.2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.
		17IS81.3	Compare different Application protocols for IoT.
		17IS81.4	Elaborate the need for Data Analytics and Security in IoT.
		17IS81.5	Design and Develop programs using Arduino and Raspberry Pi board to interface with various sensors.
		17IS81.6	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.
17CS82	BIG DATA ANALYTICS	17CS82.1	Master the concepts of HDFS and MapReduce framework
		17CS82.2	Investigate Hadoop related tools for big data analytics and perform basic Hadoop administration
		17CS82.3	Recognise the role of Business Intelligence, data warehousing and visualisation in decision making
		17CS82.4	Infer the inportatance of core data mining techiques for data analytics
		17CS82.5	Compare and contrast different Text Mining techiques
		17CS82.6	Illustrate real world applications based on MapReduce programming using big data analytics
17CS834	SYSTEM MODELLING AND SIMULATION	17CS834.1	Understanding simulation and its types with examples
		17CS834.2	Review on basics concepts and types of models
		17CS834.3	Problem soving using random number generation and random variates
		17CS834.4	Estimating the output performance of model using different types of test
		17CS834.5	Verification and validation of the model
		17CS834.6	Apply simulation for real time problem

Subject Code	Subject	Course Outcomes	Course Outcomes
18CS32	Data Structures And Applications	18CS32.1	Acquire knowledge of various types of data structures and its operations.
		18CS32.2	Apply the knowledge of linear data structures for problem solving.
		18CS32.3	Analyse and apply non-linear data structures for problem solving.
		18CS32.4	Implement the concepts of sorting and searching algorithms.
		18CS32.5	Demonstrate the files operations and hashing techniques.
		18CS32.6	Implement the programs with appropriate data structures.
18CS33	Analog And Digital Electronics	18CS33.1	Design and analyze application of analog circuits using photo devices, timer IC, power supply and regulator IC.
		18CS33.2	Illustrate op-amp applications, A/D and D/A conversion circuits.
		18CS33.3	Realize digital circuits using Karnaugh Map , and Quine-McClusky Methods
		18CS33.4	Anlyze designing different data processing circuits and PLDs
		18CS33.5	Develop simple VHDL programs along with gates and flip flops .
		18CS33.6	Design registers and counters and compare the types.
18CS34	Computer Organization	18CS34.1	Demonstrate the knowledge of basic concepts of computer organization: structure and operations of computer and their peripherals
		18CS34.2	Design and develop programs as sequencs or subroutine using machine instruction
		18CS34.3	Illustrate different mode of communication with input ouput devices and standard i/o interfaces
		18CS34.4	Design and analyse heriachial memory system
		18CS34.5	Apply the arthemic and logical operations with integer and floating point operands
		18CS34.6	Demostrate the basic multiple bus organization, embedded system and multiprocessor
18CS35	Software Engineering	18CS35.1	Assess professional and ethical responsibility, software engineering principles and activities involved in building large software programs.
		18CS35.2	Demonstrate the process of requirements gathering, classification, specification and validation.
		18CS35.3	Outline the concepts of object-oriented and modeling
		18CS35.4	Design models for software system, component and process within realistic constraints.
		18CS35.5	Apply, design, implement, verify, validate and maintain software systems with metrics.
		18CS35.6	Apply cost estimation and time scheduling for quality project activities.
18CS36	Discrete Mathematical Structures	18CS36.1	Apply mathematical logic to represent knowledge and truth verification
		18CS36.2	Illustrate the mathematical induction uses in ordering numbers and counting using permutations and combinations
		18CS36.3	Demonstrate fundamental mathematical concepts using sets, relations and functions
		18CS36.4	Understand the concepts of inclusion, exclusion and derangements of numbers
		18CS36.5	Formulate problems and solve recurrence relations
		18CS36.6	Solve real world problems using graphs and trees

Subject Code	Subject	Course Outcomes	Course Outcomes
18CSL37	Analog and Digital Electronics Laboratory	18CSL37.1	Analyze analog circuits including operational amplifier timer etc..
		18CSL37.2	Construct and simultate the design of various analog using simulation packages like multisim
		18CSL37.3	Construct and implement various combinational circuits using digital trainer kit
		18CSL37.4	Construct and simulate the design of various digital circuits using simullation packages xilinx.
		18CSL37.5	Analyse flip flops and their operations along with counters and registers
		18CSL37.6	Design synchronous and asynchronous sequential circuits
18CSL38	Data Structure Laboratory	18CSL38.1	Develop and execute programs to demonstrate the usage of basic C language constructs
		18CSL38.2	Develop, debug and demonstrate the operations of different types of linear data structures
		18CSL38.3	Implement the operations of different types of non- linear data structures.
		18CSL38.4	Demonstrate the applications of data structures.
		18CSL38.5	Illustrate the working of files and hashing techniques.
		18CSL38.6	Apply appropriate data structures for solving real world problems.
18CS42	Design and Analysis of Algorithms	18CS42.1	Demonstrate the ability to understand mathematical formulation, complexity analysis and methodologies for algorithms.
		18CS42.2	Analyze the applicability of divide and conquer technique to solve the given problem.
		18CS42.3	Apply the greedy technique paradigm for obtaining best solution to the given problem
		18CS42.4	Design and develop an algorithm using dynamic programming technique and analyze the time complexity.
		18CS42.5	Devise an algorithm using design strategies-Backtracking, Branch and Bound and Computational problem classes for problem solving.
		18CS42.6	Select and analyse an appropriate algorithm design strategy for solving any real world problem.
18CS43	Operating Systems	18CS43.1	Demonstrate the need and basic concepts of Operating System and different types of Operating Systems.
		18CS43.2	Analyse various Scheduling algorithms and solve problems related to resource management.
		18CS43.3	Illustrate the concepts of process synchronization, semaphores and monitors, deadlock.
		18CS43.4	Apply the concepts of memory management and solve the related problems.
		18CS43.5	Establish the File concepts, directory concepts, access methods and its implementation.
		18CS43.6	Exhibit disk scheduling concepts and illustrate the Linux Operating System with Case Studies.
18CS44	Microcontroller & Embedded System	18CS44.1	Describe the architectural features and instructions of ARM microcontroller
		18CS44.2	Apply the knowledge gained for programming ARM for different applications
		18CS44.3	Interface external devices and I/O with ARM microcontroller
		18CS44.4	Interpret the hardware components and their selection method based on the characteristics of an embedded system
		18CS44.5	Develop the hardware/ software co-design and firm design approaches
		18CS44.6	Demonstrate the need of real time operating system for embedded system applications

Subject Code	Subject	Course Outcomes	Course Outcomes
18CS45	Object Oriented Concepts	18CS45.1	Demonstrate the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.
		18CS45.2	Design and develop java application programs using OOP principles and proper program structure
		18CS45.3	Design and develop java programs using inheritance and exception handling mechanisms.
		18CS45.4	Creaed java programs using packages, interfaces and multi- threaded conceppts
		18CS45.5	Design and develop GUI for application programming using event handling and swings
		18CS45.6	Write java programs to solve real world problems
18CS46	Data Communicatio n	18CS46.1	Demonstrate the basic concepts of computer networks and the working of physical layer.
		18CS46.2	Demonstrate the concepts of data and signal, data transmission, data conversion and switching model and solve revalent problems
		18CS46.3	Illustrate the various error detection and correction techniques and solve problems.
		18CS46.4	Analyze different error free transmission techniques.
		18CS46.5	Demonstrate Media access control protocols.
		18CS46.6	Identify and demonstrate the different network protocols for wired and wireless networks
18CSL47	Design and Analysis of Algorithm Laboratory	18CSL47.1	Demonstrate and implement programs using basic Java features and IDE tools.
		18CSL47.2	Develop programs to demonstrate the concepts of divide and conquer technique.
		18CSL47.3	Illustrate and implement algorithms for solving combinatorial problems and analyze time complexity.
		18CSL47.4	Illustrate and implement algorithms for solving graphically represented problems and analyze time complexity.
		18CSL47.5	Measure and compare the performance of a problem implemented using different algorithmic design techniques.Compare between them
		18CSL47.6	Analyse the timecomplexity of the algorithm implemented for the given problem statement.
18CSL48	Microcontrolle r & Embedded System Laboratory	18CSL48.1	Develop assembly programming using arithmetic and logical instructions
		18CSL48.2	Develop assembly programming using Load/store and branching instructions
		18CSL48.3	Develop embedded C programs to demonstrate the working of UART and motors
		18CSL48.4	Develop embedded C programs to demonstrate the working of DAC and ADC
		18CSL48.5	Develop embedded C programs to demonstrate the working of LCD and LED
		18CSL48.6	Conduct the real world experiments on an ARM7TDMI/LPC2148 evaluation board using evaluation version of embedded C & keil Uvision -4 tool/complier

18CS51	Management, Entrepreneurs hip for IT Industry	18CS51.1	Illustrate the basic principles and concepts of management, planning and organization.
		18CS51.2	Identify the purpose of staffing and interpret the concepts of directing and controlling.
		18CS51.3	Categorize the types and roles of an entrepreneur, along with identification of business opportunities.
		18CS51.4	Create the project report and perform the effective utilization of the resources through Enterprise Resource Planning.
		18CS51.5	Realize the need for small scale and micro industries.
		18CS51.6	Demonstrate the importance for entrepreneurship through case studies and Make use of IPRs and institutional support in entrepreneurship.

Subject Code	Subject	Course Outcomes	Course Outcomes
18CS52	Computer Networks and security	18CS52.1	Demonstrate the various application layer protocols
		18CS52.2	Apply the knowledge of concepts of transport layer
		18CS52.3	Apply the knowledge of concepts of network layer
		18CS52.4	Analyze and apply concepts of security in networks
		18CS52.5	Demonstrate the concepts of multimedia data communication
		18CS52.6	Apply th eknowledge of computer networks and security to solve problems
18CS53	Data Base Management System	18CS53.1	Demonstrate the basics of database, data models and architecture.
		18CS53.2	Design ER Model for given case study.
		18CS53.3	Apply the basics of database and formulate the problems based on mathematical models using relational algebra concepts.
		18CS53.4	Formulate solutions to a given problem using Structured Query Language (SQL).
		18CS53.5	Analyze the applicapability of normalization level to a given problem in databases.
		18CS53.6	Demonstrate the knowledge of building applications to interact with databases, perform transactions, provide security and recovery protocols.
18CS54	Automata Theory and Computability	18CS54.1	Acquire the fundamental knowledge of the core concepts in automata theory
		18CS54.2	Design finite state machines for recongninzing regular language
		18CS54.3	Learn how to translate between different models of computation and also reduction of a problem to a formal model.
		18CS54.4	Understand, design ,analyse and interpret context free languages, expressions and grammars.
		18CS54.5	Determine the decidability and intracability of computational problems using turning machine
		18CS54.6	Discussions of theorems using appropriate properties and case studies in automata theory
18CS55	Application development using Python	18CS55.1	Demonstrate the basics of python language.
		18CS55.2	Identify the methods to create and manipulate lists, tuples and dictionaries.
		18CS55.3	Implement commonly used operations involving regular expressions and file system.
		18CS55.4	Interpret the concepts of Object-Oriented Programming with Python
		18CS55.5	Design and develop the websites scraping and working with CSV, JSON and other file formats.
		18CS55.6	Build the applications using the knowledge of python to solve real world problems
18CS56	Unix Programming	18CS56.1	Describe the features of unix and basic unix commands
		18CS56.2	Demonstrate differen unix files and permissions
		18CS56.3	Implement shell scripts using the knowledge of unix commands, shell basics and shell environment
		18CS56.4	Understand the environment of a process and its operations by using APIs for process control
		18CS56.5	Ability to make use of different functions using IPC methods
		18CS56.6	Ability to use signals APIs and Daemon process functions to demonstrate signal handling

Subject Code	Subject	Course Outcomes	Course Outcomes
18CSL57	Computer Network Laboratory	18CSL57.1	Develop programs to demonstaret the communication for wired networks using NS-3 simulator
		18CSL57.2	Develop programs to demonstaret the communication for wireless networks using NS-3 simulator
		18CSL57.3	Develop programs to related to data integrity and security
		18CSL57.4	Create programs to transfer data using TCP and UDP transport layer prorocols
		18CSL57.5	Develop programs to find the shortest path using routing alogorithms
		18CSL57.6	Develop programs to avoid congestion in the network
18CSL58	DBMS Laboratory with mini project	18CSL58.1	Design ER diagram, relational schema and develop database for a given problem and perform operations using simple SQL queries.
		18CSL58.2	Create ER diagram, relational schema and develop database for a given problem using SET and DELETE operation.
		18CSL58.3	Design ER diagram, relational schema and develop database for a given problem using JOIN operation and eliminate redundancies.
		18CSL58.4	Create ER diagram, relational schema and develop database for a given problem using nested and co-related queries
		18CSL58.5	Design and develop a mini-project for real world application using suitable DBMS.
		18CSL58.6	Apply the knowledge of Java/ PHP / C# / Python / any other front end tool to build a GUI to store, retrieve and manipulate data.
18IS61	File structures	18IS61.1	Demonstrate the fundamental concepts of file structures and its operations .
		18IS61.2	Apply the knowledge of organization of files on a secondary device.
		18IS61.3	Illustrate consequential processing and multilevel indexing techniques.
		18IS61.4	Apply the concept of multilevel indexing techniques.
		18IS61.5	Implement a suitable hashing techniques for storage and retrieval of records.
		18IS61.6	Create a file structure for an appropriate application with a suitable indexing technique.
18IS62	Software Testing	18IS62.1	Demonstrate the different testing appraches testing attributes test metrics and examples
		18IS62.2	Analyze different testing techniques and derive test cases for any given problem
		18IS62.3	Apply suitable testing model to a given problem
		18IS62.4	Demonstrate system integration and interaction testing with examples
		18IS62.5	Demonstarte basic principles dependability properties to test the quality of the software
		18IS62.6	Create test execution through manual testing and tools documentation and analysis of reports, planning and monitoring
18CS63	Web Technology and its applications	18CS63.1	Design structured and semantic web pages using HTML and CSS.
		18CS63.2	Modify the format of tables and forms in web pages using HTML and CSS properties.
		18CS63.3	Combine Javascipt to web pages as client-side scripts to add dynamic contents.
		18CS63.4	Apply PHP as a server-side script to make web pages more responsive.
		18CS63.5	Apply Object-oriented principles for web development using PHP.
		18CS63.6	Utilize Javascript frameworks that follows MVC paradigm to design application & develop client-server comunication model using XML.

Subject Code	Subject	Course Outcomes	Course Outcomes
18CS641	Data Mining and Data Warehousing	18CS641.1	Demonstarte the functionality of the various concepts of data warehouse concepts
		18CS641.2	Implementation of data warehouse and data mining concepts
		18CS641.3	Analyze and solve problems related to association rules
		18CS641.4	Apply and evaluate classification techniques
		18CS641.5	Analyze and apply different clustering algorithms
		18CS641.6	Implement data warehouse and apply data mining techniques to solve real world arises problems
18CS643	Cloud Computing & its Applications	18CS643.1	Demonstrate the specific challenges, issues and technologies in Cloud Computing.
		18CS643.2	Illustrate the cloud computing architecture and its applications.
		18CS643.3	Demonstrate the concepts of thread programming and high throughput computing.
		18CS643.4	Illustrate the concept of data intensive computing with applications.
		18CS643.5	Demonstrate the cloud platforms and its scientific applications in industries.
		18CS643.6	Analyze the cloud computing services, virtualization and its applications.
18CS644	Advanced JAVA and J2EE	18CS644.1	Apply the concepts of enumerations, auto boxing and annotations in java programs
		18CS644.2	Design java applications to demonstrate the usage of collection framework
		18CS644.3	Implement java programs by applying the concepts of String class and its methods.
		18CS644.4	Write web applications using Servlets and JSPs in Tomcat environment.
		18CS644.5	Create JDBC connection for any real time database applications using java programming language.
		18CS644.6	Write Java application to solve real world problems.
18ISL66	Software Testing Laboratory	18ISL66.1	Apply the knowledge of identifying specification requirement, developing code and derive test cases for any problem using boundary value analysis method
		18ISL66.2	Derive the test cases for any problem using equivalence class testing method
		18ISL66.3	Derive the test cases for any problem using decsion table approach
		18ISL66.4	Design and construct program graph and derive test cases for any given problem using path testing
		18ISL66.5	Design and construct program graph and derive test cases for any given problem using data flow testing
		18ISL66.6	Demonstrate study experiment problems with any of the testing method
18ISL67	File Structure Laboratory with mini project	18ISL67.1	Solve the problems using fundamental file operations.
		18ISL67.2	Implement a program using appropriate field and record structure to store data and perform operations on files.
		18ISL67.3	Design a simple indexing technique to demonstrate efficient retrieval of data.
		18ISL67.4	Write and Demonstrate a program for co-sequential processing of a large files.
		18ISL67.5	Create appropriate indexing structure to store and retrieve data from files.
		18ISL67.6	Design and develop a program to demonstrate appropriate indexing techniques.

Subject Code	Subject	Course Outcomes	Course Outcomes
18CSMP68	Mobile Application Development	18CSMP68.1	Learn and acquire the art of Android Programming.
		18CSMP68.2	Configure Android studio to run the applications.
		18CSMP68.3	Understand and implement Android's User interface functions.
		18CSMP68.4	Create, modify and query on SQlite database.
		18CSMP68.5	Inspect different methods of sharing data using services.
		18CSMP68.6	Design and develop a mini project to demonstrate various andriod application.
18CS71	Artificial Intelligence & Machine Learning	18CS71.1	Analyze and formalize the real world problems as a state space, graph, design heuristics and select amongst different search or game based techniques to solve them.
		18CS71.2	Attain the capability to represent and solve various real life problems using logic based techniques and use this to perform inference or reasoning.
		18CS71.3	Investigate Concept Learning and Apply Decision Tree concepts on various data sets.
		18CS71.4	Solve the problems related to Artificial Neural Networks.
		18CS71.5	Analyze Bayesian learning algorithm to classify different data sets.
		18CS71.6	Illustrate the concepts of Instance based learning and Reinforcement learning algorithms.
18CS72	Big Data & Analytics	18CS72.1	Understand Hadoop Distributed File system and examine MapReduce Programming
		18CS72.2	Explore Hadoop tools and manage Hadoop with Ambari
		18CS72.3	Appraise the role of Business intelligence and its applications across industries
		18CS72.4	Assess core data mining techniques for data analytics
		18CS72.5	Identify various Text Mining techniques
		18CS72.6	Illustrate real world applications based on MapReduce Programming using BigData Analytics.
18CS731	Software architecture and Design pattern	18CS731.1	Demonstrate the fundamentals of design patterns, Analyze a case study to gather requirements, design and implement the system.
		18CS731.2	Illustrate structural patterns like Adpater, Bridge, Composite.
		18CS731.3	Illustrate behavioural patterns like Chain of Responsibility, Command, Interpreter.
		18CS731.4	Design and implement interative systems using MVC architecture.
		18CS731.5	Implement a distributed object-oriented application.
		18CS731.6	Apply suitable pattern for a given problem.
18CS734	User Interface Design	18CS734.1	Demonstrate the importance of user interface and benefits of good design.
		18CS734.2	Apply the user interface design process and business function.
		18CS734.3	Illustrate the different types of system menus and navigation schemes
		18CS734.4	Illustrate the window presentation styles and functions
		18CS734.5	Develop and analyze the importance of screen based control and testing
		18CS734.6	Design the UID in real time application

Subject Code	Subject	Course Outcomes	Course Outcomes
18CS743	Natural Language Processing	18CS743.1	Describe the fundamental concepts and techniques of natural language processing.
		18CS743.2	Distinguish among the various techniques, taking into account the assumptions, strengths, and weaknesses of each.
		18CS743.3	Use appropriate descriptions, visualizations, and statistics to communicate the problems and their solutions.
		18CS743.4	Analyze large volume text data generated from a range of real-world applications.
		18CS743.5	Deploy the use of deep recurrent models for text prediction, and issues that separate NLP from other application domains.
		18CS743.6	Applying deep learning tools to NLP through examples and practical projects.
18CS744	Cryptography	18CS744.1	Understand cryptography basics, algorithms and mathematical background for cryptography
		18CS744.2	Analyze the important cryptographic algorithms
		18CS744.3	Able to illustrate Public and Private Key Cryptosystem
		18CS744.4	Understand key management issues and algorithms
		18CS744.5	Understand digital certificates, authentication protocols and email security
		18CS744.6	Understand IP Security
18CSL76	Artificial Intelligence & Machine Learning Lab	18CSL76.1	Implement the searching algorithms(A* and AO* search) using AI concept.
		18CSL76.2	Implement and demonstrate the concept learning algorithms (Candidate Elimination algorithm).
		18CSL76.3	Demonstrate working of the decision tree & apply this knowledge to classify a new sample (ID3).
		18CSL76.4	Build an artificial neural network by implementing the back propagation algorithm.
		18CSL76.5	Apply the naive Bayesian classification methods and build Bayesian network
		18CSL76.6	Implement EM algorithm, K-Means & compare their results and Investigate instance based and regression algorithms.
18CS81	Internet of Things	18CS81.1	Interpret the impact and challenges posed by IoT networks leading to new architectural models.
		18CS81.2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.
		18CS81.3	Compare different Application protocols for IoT.
		18CS81.4	Elaborate the need for Data Analytics and Security in IoT.
		18CS81.5	Design and Develop programs using Arduino and Raspberry Pi board to interface with various sensors.
		18CS81.6	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.
18CS822	Storage Area Networking	18CS822.1	Demonstrate the Storage Area Networks characteristics, components and storage architectures and solve problems.
		18CS822.2	Illustrate the concept of RAID and their suitability for different application environments and solve problems.
		18CS822.3	Demonstrate file sharing operations on NAS and IP-SAN of the different networks and concepts of business continuity and disaster recovery in a storage infrastructure.
		18CS822.4	Demonstrate the working of Storage Virtualization on Various levels of Storage.
		18CS822.5	Illustrate the concepts of cloud copmuting
		18CS822.6	Demonstrate the Knowledge of Securing the local replication in Storage Infrastructure

Subject Code	Subject	Course Outcomes	Course Outcomes
18CS823	NoSQL Database	18CS823.1	Introduce to NoSQL , Learning Basics and comparison with Relational Databases
		18CS823.2	Define, compare and use the four types of NoSQL Databases (Document-oriented, KeyValue Pairs, Column-oriented and Graph databases).
		18CS823.3	Understanding of Graph database and data models(Aggregate Data Model and Distribution Data Model)
		18CS823.4	Demonstrate an understanding of the detailed architecture, define objects, load data, query data and performance tune Column-oriented NoSQL databases.
		18CS823.5	Explain the detailed architecture, define objects, load data, query data and performance tune Document-oriented NoSQL databases
		18CS823.6	Illustrate the Map Reduce processing technique and Key Value Databases with examples.

Subject Code	Subject	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
18CPS13/23	C Programming for Problem Solving Syllabus	✓	✓	✓		✓					✓			✓		✓
18CPL17/27	C Programming Laboratory	✓	✓	✓		✓				✓			✓	✓		✓
18MAT31	Transform Calculus, Fourier Series And Numerical Techniques	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
18CS32	Data Structures And Applications	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
18CS33	Analog And Digital Electronics	✓	✓	✓		✓								✓	✓	
18CS34	Computer Organization	✓	✓	✓	✓								✓	✓	✓	✓
18CS35	Software Engineering	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓
18CS36	Discrete Mathematical Structures	✓	✓	✓	✓								✓	✓	✓	
18CSL37	Analog and Digital Electronics Laboratory	✓	✓	✓		✓								✓	✓	
18CSL38	Data Structure Laboratory	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓	✓
18MAT41	Complex Analysis, Probability And Statistical Methods	✓	✓	✓	✓	✓	✓			✓	✓		✓	✓	✓	✓
18CS42	Design and Analysis of Algorithms	✓	✓	✓	✓	✓							✓	✓	✓	✓
18CS43	Operating Systems	✓	✓	✓	✓			✓		✓	✓	✓	✓	✓	✓	✓
18CS44	Microcontroller & Embedded System	✓	✓	✓	✓	✓	✓				✓		✓	✓	✓	✓
18CS45	Object Oriented Concepts	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓

18CS46	Data Communication	✓	✓	✓	✓		✓						✓	✓	✓	✓
18CS47	Design and Analysis of Algorithm Laboratory	✓	✓	✓	✓	✓					✓		✓	✓	✓	✓
18CSL48	Microcontroller & Embedded System Laboratory	✓	✓	✓	✓	✓	✓			✓	✓		✓	✓	✓	✓
18CS51	Management, Entrepreneurship for IT Industry	✓	✓				✓		✓	✓	✓	✓	✓	✓	✓	✓
18CS52	Computer Networks and security	✓	✓	✓	✓	✓	✓		✓				✓	✓	✓	✓
18CS53	Data Base Management System	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
18CS54	Automata Theory and Computability	✓	✓	✓	✓	✓							✓	✓	✓	✓
18CS55	Application development using Python	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
18CS56	Unix Programming	✓	✓	✓		✓	✓			✓		✓	✓	✓	✓	✓
18CSL57	Computer Network Laboratory	✓	✓	✓	✓										✓	✓
18CSL58	DBMS Laboratory with mini project	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
18IS61	File structures	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓	✓
18IS62	Software Testing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
18CS63	Web Technology and its applications	✓	✓	✓		✓				✓			✓	✓	✓	
18CS641	Data Mining and Data Warehousing	✓	✓	✓									✓	✓	✓	✓

18CS643	Cloud Computing & its Applications	✓	✓			✓	✓		✓			✓	✓	✓		✓
18CS644	Advanced JAVA and J2EE	✓	✓	✓	✓							✓	✓	✓	✓	✓
18ISL66	Software Testing Laboratory	✓	✓	✓	✓	✓					✓			✓	✓	✓
18ISL67	File Structure Laboratory with mini project	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓	✓
18CSMP68	Mobile Application Development	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
18CS71	Artificial Intelligence & Machine Learning	✓	✓	✓	✓			✓	✓				✓	✓	✓	✓
18CS72	Big Data & Analytics	✓	✓	✓			✓		✓				✓	✓	✓	✓
18CS731	Software architecture and Design pattern	✓	✓	✓	✓	✓			✓	✓		✓	✓	✓	✓	✓
18CS734	User Interface Design	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
18CS743	Natural Language Processing	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓
18CS744	Cryptography	✓	✓	✓	✓						✓		✓	✓	✓	✓
18CSL76	Artificial Intelligence & Machine Learning Lab	✓	✓	✓	✓	✓							✓	✓	✓	✓
18CS81	Internet of Things	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓	
18CS822	Storage Area Networking	✓	✓	✓										✓	✓	✓
18CS823	NoSQL Database	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 2.1.1A 2018 Scheme Syllabus – Correlation Matrix (Subjects with POs and PSOs mapping)

Subject Code	Subject	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
17 PCD23	Programming in C Data Structures	✓	✓	✓										✓		
17CPL26	Computer Programming Laboratory	✓	✓	✓		✓				✓			✓	✓		✓
17MAT31	Engineering Mathematics-III	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
17CS32	Analog and Digital Electronics	✓	✓	✓	✓	✓	✓						✓	✓	✓	✓
17CS33	Data Structures and Applications	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓
17CS34	Computer Organization	✓	✓	✓									✓	✓	✓	✓
17CS35	Unix and Shell Programming	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17CS36	Discrete Mathematical Structures	✓	✓	✓	✓								✓	✓	✓	
17CSL37	Analog and Digital Electronics Laboratory	✓	✓	✓		✓							✓	✓		
17CSL38	Data Structure Application Laboratory	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓	✓
17MAT41	Engineering Mathematics -IV	✓	✓	✓	✓	✓	✓			✓	✓		✓	✓	✓	✓
17CS42	Object Oriented Concepts	✓	✓	✓	✓	✓							✓	✓	✓	✓
17CS43	Design and Analysis of Algorithms	✓	✓	✓	✓	✓							✓	✓	✓	✓
17CS44	Microprocessor and Microcontroller	✓	✓	✓	✓	✓	✓				✓		✓	✓	✓	✓
17CS45	Software Engineering	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17CS46	Data Communication	✓	✓	✓	✓		✓						✓	✓	✓	✓
17CSL47	Design and Analysis of Algorithm Laboratory	✓	✓	✓	✓	✓					✓		✓	✓	✓	✓

17CSL48	Microprocessor and Microcontroller Laboratory	✓	✓	✓		✓	✓		✓	✓			✓	✓	✓	
17CS51	Management and Entrepreneurship	✓	✓				✓		✓	✓	✓	✓	✓	✓	✓	✓
17CS52	Computer Networks	✓	✓	✓	✓	✓	✓		✓				✓	✓	✓	✓
17CS53	Database Management System	✓	✓	✓	✓	✓						✓	✓	✓	✓	✓
17CS54	Automata Theory and Computability	✓	✓	✓	✓								✓	✓	✓	✓
17CS553	Advanced Java and J2EE	✓	✓	✓	✓							✓	✓	✓	✓	✓
17CS562	Artificial Intelligence	✓	✓	✓					✓				✓	✓	✓	✓
17CSL57	Computer Networks Laboratory	✓	✓	✓	✓										✓	✓
17CSL58	Database Management SystemLaboratory	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
17CS61	Cryptography Network Security and Cyber Law	✓	✓	✓			✓		✓				✓	✓	✓	✓
17IS62	File Structure	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓	✓
17IS63	Software Testing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17CS64	Operating System	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17CS651	Data Mining and Data Warehousing	✓	✓	✓									✓	✓	✓	✓
17CS653	Operational Research	✓	✓	✓	✓		✓						✓	✓	✓	
17CS664	Python Application Programming	✓	✓	✓	✓	✓							✓	✓	✓	✓
17ISL67	Software Testing Laboratory	✓	✓	✓	✓	✓					✓			✓	✓	✓
17ISL68	File Structure Laboratory	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓	✓
17CS71	Web Technology and its Applications	✓	✓	✓		✓							✓	✓	✓	

17CS72	Software Architecture and Design Patterns	✓	✓	✓	✓								✓	✓	✓	✓
17CS73	Machine Learning	✓	✓	✓	✓		✓	✓		✓		✓	✓	✓	✓	✓
17CS742	Cloud computing and its applications	✓	✓			✓	✓		✓			✓	✓	✓		✓
17CS754	Storage Area Network	✓	✓	✓										✓	✓	✓
17CSL76	Machine Learning Laboratory	✓	✓	✓	✓		✓			✓			✓	✓	✓	✓
17CSL77	Web Technology Laboratory with Mini Project	✓	✓	✓		✓				✓		✓		✓	✓	✓
17CS81	Internet of things and its application	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓	
17CS82	Big data analytics	✓	✓	✓			✓		✓					✓	✓	✓
17CS834	System modeling and simulation	✓	✓	✓	✓								✓	✓	✓	✓

Table: 2017 Scheme CBCS – Correlation Matrix (Subjects with POs and PSOs mapping)

Subject Code	Subject	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
15PCD23	Programming in C Data Structures	✓	✓	✓										✓		
15CPL26	Computer Programming Laboratory	✓	✓	✓		✓				✓			✓	✓		✓
15MAT31	Engineering Mathematics-III	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
15CS32	Analog and Digital Electronics	✓	✓	✓	✓	✓	✓						✓	✓	✓	✓
15CS33	Data Structures and Applications	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓
15CS34	Computer Organization	✓	✓	✓	✓								✓	✓	✓	✓
15CS35	Unix and Shell Programming	✓	✓	✓		✓								✓	✓	
15CS36	Discrete Mathematical Structures	✓	✓	✓	✓								✓	✓	✓	
15CSL37	Analog and Digital Electronics Laboratory	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓
15CSL38	Data Structure Application Laboratory	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓	✓
15MAT41	Engineering Mathematics -IV	✓	✓	✓	✓	✓	✓			✓	✓		✓	✓	✓	✓
15CS42	Software Engineering	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
15CS43	Design and Analysis of Algorithms	✓	✓	✓	✓	✓							✓	✓	✓	✓
15CS44	Microprocessor and Microcontroller	✓	✓	✓	✓	✓	✓				✓		✓	✓	✓	✓
15CS45	Object Oriented Concepts	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
15CS46	Data Communication	✓	✓	✓	✓		✓						✓	✓	✓	✓
15CS47	Design and Analysis of Algorithm Laboratory	✓	✓	✓	✓	✓					✓		✓	✓	✓	✓
15CSL48	Microprocessor and Microcontroller Laboratory	✓	✓	✓	✓	✓	✓			✓	✓		✓	✓	✓	✓

15CS51	Management and Entrepreneurship	✓	✓				✓		✓	✓	✓	✓	✓	✓	✓	✓
15CS52	Computer Networks	✓	✓	✓	✓							✓	✓	✓	✓	✓
15CS53	Database Management System	✓	✓	✓	✓	✓						✓	✓	✓	✓	✓
15CS54	Automata Theory and Computability	✓	✓	✓	✓								✓	✓	✓	✓
15CS553	Advanced Java and J2EE	✓	✓	✓	✓							✓	✓	✓	✓	✓
15CS562	Artificial Intelligence	✓	✓	✓	✓		✓	✓	✓				✓	✓	✓	✓
15CSL57	Computer Networks Laboratory	✓	✓	✓	✓						✓				✓	✓
15CSL58	Database Management System Laboratory	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
15CS61	Cryptography Network Security and Cyber Law	✓	✓	✓			✓		✓				✓	✓	✓	✓
15CS62	File Structure	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓	✓
15IS63	Software Testing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
15CS64	Operating System	✓	✓	✓	✓					✓	✓		✓	✓	✓	✓
15CS651	Data Mining and Data Warehousing	✓	✓	✓	✓								✓	✓	✓	✓
15CS653	Operational Research	✓	✓	✓	✓		✓						✓	✓	✓	✓
15CS664	Python Application Programming	✓	✓	✓	✓	✓							✓	✓	✓	✓
15ISL67	Software Testing Laboratory	✓	✓	✓	✓	✓					✓			✓	✓	✓
15ISL68	File Structure Laboratory	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓	✓
15CS71	Web Technology and its Applications	✓	✓	✓		✓				✓			✓	✓	✓	
15IS72	Software Architecture and Design Patterns	✓	✓	✓	✓								✓	✓	✓	✓

15CS73	Machine Learning	✓	✓	✓	✓		✓	✓		✓		✓	✓	✓	✓	✓
15CS754	Storage Area Network	✓	✓	✓										✓	✓	✓
15CSL76	Machine Learning Laboratory	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
15CSL77	Web Technology Laboratory with Mini Project	✓	✓	✓		✓				✓	✓	✓	✓	✓	✓	✓

Table 2.6 CBCS – Correlation Matrix (Subjects with POs and PSOs mapping)

DIRECT TAXATION

Subject Code: 20MBAFM 304 **Credits: 4**

COURSE OBJECTIVES

1. To provide the students with a comprehensive understanding of basic concepts of Income tax
2. To understand the computation of taxable Income under different heads.
3. To know the deductions available while computing Income.
4. To understand corporate taxation system in India

COURSE OUTCOMES (COs)

At the end of the course students will be able to:
1. Understand the basics of direct taxation and process of determining the residential status.
2. Compute taxable income under the head 'Income from Salary and House property'.
3. Determine the taxable profits of Business, Professions and Capital assets.
4. Apply permissible deductions and calculate the tax liability of Individuals of all categories.
5. Evaluate the corporate tax liability with special reference to Minimum Alternative Tax.

PROGRAMME OUTCOMES (POs)

Student will be able to:

PO1. Acquire Sufficient **theoretical knowledge** and are enabled to apply them to solve practical problems in business and other organizations/institutions of importance.

PO2. Apply Effective communication skills with a high degree of lateral and critical thinking that enhances learnability, developed for being continuously employable.

PO3. Demonstrate leadership qualities, ethically sound, enabled with decision making skills that reflect a high degree of social consciousness

PO4. Recognise the need for sustained **research orientation** to comprehend a growingly complex, economic, legal and ethical environment

PO5. Possess self-sustaining **entrepreneurship qualities** that encourages calculated risk taking.

Mapping of Program outcome & Course outcome

COURSE OUTCOME	PROGRAMME OUTCOME				
	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	1	3	3	-	1
CO 2	3	-	2	1	3
CO 3	3	-	3	1	1
CO 4	2	2	2	-	2
CO 5	2	1	3	-	-

III SEMESTER

Course Code	ENGINEERING MATHEMATICS (15MAT31)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO2	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO3	2	3	-	-	1	1	-	-	-	1	-	-	-	-	-
CO4	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO5	2	2	-	-	-	1	-	-	-	1	-	-	-	-	-
AVG															

Course Code	MSM(15ME32)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1	0	0	1	0	2	0	0	0	3	3	0	0
CO2	2	2	1	0	0	1	0	2	0	0	0	3	3	0	0
CO3	2	2	1	0	0	1	0	2	0	0	0	3	3	0	0
CO4	2	2	1	0	0	1	0	2	0	0	0	3	3	0	0
CO5	2	2	1	0	0	1	0	2	0	0	0	3	3	0	0
AVG	2	2	1	0	0	1	0	2	0	0	0	3	3	0	0

Course Code	BTD(15ME33)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	0	0	1	1	0	0	1	0	1	1	1	0
CO2	3	2	2	0	0	1	1	0	0	0	0	1	1	1	0
CO3	3	2	0	0	0	0	0	0	0	0	1	1	1	1	0
CO4	3	2	2	0	0	2	0	0	0	0	0	1	1	1	0
CO5	3	2	2	0	0	1	0	0	0	0	0	1	1	1	0
AVG	3	2.2	2	0	0	1.3	1	0	0	1	1	1	1	1	0

Course Code	MOM(15ME34)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	0	0	1	1	1	0	0	0	1	3	0	0
CO2	3	3	1	0	0	1	1	1	0	0	0	1	3	0	0
CO3	3	3	1	0	0	1	1	1	0	0	0	1	3	0	0
CO4	3	3	2	0	0	1	1	1	0	0	0	1	3	0	0
CO5	3	3	2	0	0	1	1	1	0	0	0	1	3	0	0
AVG	3	3	1.6	0	0	1	1	1	0	0	0	1	3	0	0

Course Code	MCW(15ME35)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	0	1	2	1	1	0	0	1	0	1	3	2	2
CO2	3	0	0	0	2	1	1	0	0	1	0	1	3	1	2
CO3	3	0	0	0	2	1	0	0	0	1	0	1	3	1	2
CO4	3	0	0	1	2	2	1	0	0	1	0	1	3	2	2
CO5	3	0	0	1	2	2	1	0	0	1	0	1	3	2	2
AVG	3	0	0	1	2	1.4	1	0	0	1	0	1	3	1.6	2

Course Code	CAMD(15ME36)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	0	0	2	0	0	0	2	1	0	2	1	0	0
CO2	3	0	0	0	2	0	0	0	2	1	0	2	1	0	0
CO3	3	0	0	0	2	0	0	0	2	1	0	2	1	0	0
CO4	3	0	0	0	2	0	0	0	2	1	0	2	1	0	0
CO5	3	0	0	0	3	0	0	0	2	1	0	2	1	0	0
AVG	3	0	0	0	2.2	0	0	0	2	1	0	2	1	0	0

Course Code	Materials Testing Laboratory(15MEL37)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	0	3	3	0	0	0	0	3	0	3	3	3	3
CO2	3	3	0	3	3	0	0	2	0	3	0	3	3	3	3

IV SEMESTER

Course Code	ENGINEERING MATHEMATICS(15MAT41)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO2	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO3	2	3	-	-	1	1	-	-	-	1	-	-	-	-	-
CO4	2	2	-	-	1	1	-	-	-	1	-	-	-	-	-
CO5	2	2	-	-	-	1	-	-	-	1	-	-	-	-	-
AVG															

Course Code	KOM(15ME42)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	0	1	1	1	1	0	1	1	1	3	1	0
CO2	3	3	1	0	1	1	1	1	0	1	1	1	3	1	0
CO3	3	3	1	0	1	1	1	1	0	1	1	1	3	1	0
CO4	3	3	1	0	1	1	1	1	0	1	1	1	3	1	0
CO5	3	3	1	0	1	1	1	1	0	1	1	1	3	1	0
AVG	3	3	1	0	1	1	1	1	0	1	1	1	3	1	0

Course Code	ATD(15ME43)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	0	0	0	0	2	0	1	0	2	1	1	0
CO2	3	2	2	0	0	0	0	2	0	1	0	2	1	1	0
CO3	3	2	2	0	0	0	0	2	0	1	0	2	1	1	0
CO4	3	2	2	0	0	0	0	2	0	1	0	2	1	1	0
CO5	3	2	2	0	0	0	0	2	0	1	0	2	1	1	0
AVG	3	2	2	0	0	0	0	2	0	1	0	2	1	1	0

Course Code	FM(15ME44)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	0	0	0	0	0	0	0	0	0	2	2	0	0
CO2	3	3	0	0	0	0	0	0	0	0	0	2	2	0	0
CO3	3	3	2	0	0	0	0	0	0	0	0	2	2	0	0
CO4	3	3	2	0	0	0	0	0	0	0	0	2	2	0	0
CO5	3	2	1	0	1	0	0	0	0	0	0	2	2	0	0
AVG	3	2.8	1.7	0	1	0	0	0	0	0	0	2	2	0	0

Course Code	MTO(15ME45)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	0	0	0	1	1	0	0	1	0	1	3	2	1
CO2	3	3	0	0	0	1	1	0	0	1	0	1	3	3	1
CO3	3	2	0	0	0	1	1	0	0	1	0	1	3	3	1
CO4	3	2	2	0	0	1	1	0	0	1	0	1	3	3	1
CO5	3	2	2	0	0	1	1	0	0	1	0	1	3	3	1
AVG	3	2.3	2	0	0	1	1	0	0	1	0	1	3	2.8	1

Course Code	MMM(15ME46)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	0	0	0	0	2	0	1	0	2	2	0	0
CO2	3	2	1	0	0	0	0	1	0	1	0	1	1	0	0
CO3	3	0	2	0	0	0	0	1	0	1	0	1	1	0	0
CO4	3	0	1	0	1	0	0	1	0	1	0	1	1	0	0
CO5	3	1	1	0	1	0	0	1	0	1	0	1	1	0	0
AVG	3	1.7	1.4	0	1	0	0	1.2	0	1	0	1.2	1.2	0	0

Course Code	MMM LAB(15MEL47)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	0	0	0	0	2	0	3	0	0	3	2	2	2	2
CO2	0	0	3	2	2	0	0	2	0	0	0	1	3	0	0

CO3	3	3	3	3	2	0	0	0	0	0	0	0	3	2	2
CO4	3	3	3	3	2	0	0	0	0	0	0	0	3	2	2
CO5	3	3	3	3	2	0	0	0	0	0	0	0	3	2	2
AVG	3	3	3	3	2.4	0	0	2	0	3	0	3	3	2.4	2.4
Course Code	FF LAB(15MEL38)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	0	0	0	3	2	3	0	0	0	0	3	2	0
CO2	3	3	0	0	2	3	0	0	0	0	0	0	3	2	0
CO3	3	0	0	0	3	0	3	3	0	0	0	0	3	2	0
CO4	3	3	2	0	3	3	3	2	0	0	0	0	3	2	0
CO5	3	3	2	0	3	3	3	2	0	0	0	0	3	2	0
AVG	3	3	2	0	2.8	3	2.8	2.5	0	0	0	0	3	2	0

CO3	0	0	0	0	3	0	0	0	0	0	0	2	0	0	0
CO4	2	0	0	0	0	2	0	0	0	0	0	0	2	2	0
CO5	0	0	0	0	2	0	2	0	0	0	0	0	2	0	0
AVG	2	0	3	2	2.3	2	2	2.5	0	0	3	1.7	2.3	2	2
Course Code	MC SHOP(15MEL48)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	3	0	0	2	2	0	0	0	0	0	3	2	0
CO2	3	0	3	0	0	2	2	0	0	0	0	0	3	2	0
CO3	3	0	3	0	0	2	2	0	0	0	0	0	3	2	0
CO4	3	0	3	0	0	2	2	0	0	0	0	0	3	2	0
CO5	3	0	3	0	0	2	2	0	0	0	0	0	3	2	0
AVG	3	0	3	0	0	2	2	0	0	0	0	0	3	2	0

V SEMESTER

Course Code	M&EE(15ME51)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	0	0	0	0	1	0	1	0	3	0	3	1	0	1
CO2	2	0	0	0	0	2	0	0	3	3	0	3	1	0	1
CO3	2	2	0	0	0	2	0	0	2	2	0	3	1	0	1
CO4	3	2	0	0	1	0	0	1	1	2	0	3	1	0	1
CO5	3	2	0	0	1	0	0	1	1	2	0	3	1	0	1
AVG	2.4	2	0	0	1	1.7	0	1	1.8	2.4	0	3	1	0	1
Course Code	DOM(15ME52)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	0	3	1	0	1	0	0	0	1	3	3	2
CO2	3	3	1	0	3	1	0	1	0	0	0	1	1	2	2
CO3	3	3	1	0	2	1	0	1	0	0	0	1	3	3	3
CO4	3	3	2	0	0	1	0	1	0	0	0	1	2	3	2
CO5	3	3	2	0	0	1	0	1	0	0	0	1	3	3	3
AVG	3	3	1.4	0	2.7	1	0	1	0	0	0	1	2.4	2.8	2.4
Course Code	TM(15ME53)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	0	0	0	0	0	0	0	2	3	2	0
CO2	3	2	2	1	0	0	0	0	0	0	0	2	3	1	0
CO3	3	2	2	2	0	1	1	0	0	0	0	2	3	2	1
CO4	3	2	2	2	0	1	1	0	0	0	0	2	3	2	1
CO5	3	2	2	2	0	1	1	0	0	0	0	2	3	2	1
AVG	3	2	2	1.6	0	1	1	0	0	0	0	2	3	1.8	1
Course Code	DME1(15ME54)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	3	0	0	2	3	3	0	0	3	2	3	2	0
CO2	3	3	3	2	0	2	1	3	2	0	3	2	3	2	0
CO3	3	3	3	2	0	2	1	3	2	0	3	2	3	2	0
CO4	3	3	3	2	0	2	1	3	2	0	3	2	3	2	0
CO5	3	3	3	2	0	2	1	3	2	0	3	2	3	2	0
AVG	2.6	2.6	3	2	0	2	1.4	3	2	0	3	2	3	2	0
Course Code	TOE(15ME552)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	0	0	0	0	0	0	1	1	0	1	1	1	0
CO2	3	2	0	0	0	0	0	1	1	1	0	1	1	1	0
CO3	3	2	2	1	0	0	0	2	1	0	0	1	1	1	0
CO4	3	2	2	1	0	0	0	3	1	0	0	1	1	1	1
CO5	3	2	2	1	0	0	0	4	1	0	0	1	1	1	1
AVG	3	2	2	1	0	0	0	2.5	1	1	0	1	1	1	1
Course Code	NTM(15ME554)														

VI SEMESTER

Course Code	FEM														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	0	0	0	0	0	1	0	0	0	1	2	1	1
CO2	3	2	1	1	0	0	0	1	0	0	0	1	2	1	2
CO3	3	2	1	1	0	0	0	1	0	0	0	1	2	2	2
CO4	3	2	1	1	1	0	0	1	0	0	0	1	2	1	2
CO5	3	2	1	0	1	0	0	1	0	0	0	1	2	1	2
AVG	3	2	1	1	1	0	0	1	0	0	0	1	2	1.2	1.8
Course Code	CIM(15ME62)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	0	0	0	1	2	0	0	0	0	2	1	0	2
CO2	3	3	2	0	0	0	2	0	0	0	0	1	1	0	2
CO3	2	2	0	0	0	2	0	0	0	0	0	2	1	0	2
CO4	2	1	0	0	0	2	0	0	0	0	0	1	1	0	2
CO5	2	1	0	0	0	0	0	0	0	0	0	1	1	0	2
AVG	2	1.6	2	0	0	1.7	2	0	0	0	0	1.4	1	0	2
Course Code	HT(15ME63)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	0	0	0	0	0	0	0	0	2	2	0
CO2	3	3	3	0	0	0	0	0	0	0	0	0	2	2	0
CO3	3	3	3	0	0	0	0	0	0	0	0	0	2	2	0
CO4	3	3	3	0	0	0	0	0	0	0	0	0	2	2	0
CO5	3	3	3	0	0	0	0	0	0	0	0	0	2	2	0
AVG	3	3	3	3	0	0	0	0	0	0	0	0	2	2	0
Course Code	DME2(15ME64)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	0	0	0	0	0	0	1	0	2	3	2	0
CO2	3	3	3	2	0	1	1	0	0	1	0	2	3	2	0
CO3	3	3	3	2	0	1	1	0	0	1	0	2	3	2	0
CO4	3	3	3	2	0	1	1	0	0	1	0	2	3	2	0
CO5	3	3	3	2	2	1	1	0	2	2	0	2	3	2	0
AVG	3	3	3	2	2	1	1	0	2	1.2	0	2	3	2	0
Course Code	MF (15ME653)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1	2	0	0	0	1	0	0	1	1	0	0	1
CO2	2	1	0	1	0	0	1	0	0	0	0	0	0	0	1
CO3	0	2	1	2	0	0	0	1	0	0	1	1	0	0	1
CO4	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1
CO5	1	2	1	1	0	0	0	1	0	0	1	1	0	0	1
AVG	1.5	1.6	1	1.4	0	0	1	1	0	0	1	1	0	0	1
Course Code	AE (15ME665)														

Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	0	0	0	1	0	1	0	0	0	0	0	0	1
CO2	3	1	1	0	0	1	0	1	0	0	0	0	0	0	1
CO3	3	1	1	0	0	1	0	1	0	0	0	0	0	0	1
CO4	3	1	0	0	0	1	0	1	0	0	0	0	0	0	1
CO5	3	1	0	0	0	1	0	1	0	0	0	0	0	0	1
AVG	3	1	1	0	0	1	0	1	0	0	0	0	0	0	1
Course Code	A&R(15ME562)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	0	0	0	1	2	1	0	1	0	2	1	0	2
CO2	3	3	2	0	0	0	2	1	0	1	0	1	1	0	2
CO3	2	2	0	0	0	2	0	1	0	1	0	2	1	0	2
CO4	2	1	0	0	0	2	0	1	0	1	0	1	1	0	2
CO5	2	1	0	0	0	0	0	1	0	1	0	1	1	0	2
AVG	2.4	1.6	2	0	0	1.7	2	1	0	1	0	1.4	1	0	2
Course Code	FM Laboratory(15MEL57)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	0	3	0	0	0	0	1	0	0	0	3	3	2
CO2	3	3	0	3	0	0	0	0	1	0	0	0	3	2	2
CO3	3	3	0	3	0	0	0	0	2	0	0	0	3	3	2
CO4	3	3	0	3	0	0	0	0	2	0	0	0	3	3	2
CO5	3	3	0	3	0	0	0	0	2	0	0	0	3	3	2
AVG	3	3	0	3	0	0	0	0	1.6	0	0	0	3	2.8	2
Course Code	EC Laboratory(15MEL58)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	0	3	0	1	2	0	0	0	0	2	2	2	3
CO2	3	2	0	3	0	0	2	0	0	0	0	2	2	2	3
CO3	3	2	2	0	3	2	2	0	0	0	0	2	2	2	3
CO4	3	2	0	2	3	0	0	0	0	0	0	2	2	2	3
CO5	3	2	0	2	3	0	0	0	0	0	0	2	2	2	3
AVG	3	2	2	2.5	3	1.5	2	0	0	0	0	2	2	2	3

VII SEMESTER

Course Code	EE(15ME71)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	0	0	0	1	2	0	0	0	0	2	1	0	0
CO2	3	3	2	0	0	0	2	0	0	0	0	1	1	0	0
CO3	2	2	0	0	0	2	0	0	0	0	0	2	1	0	0
CO4	2	1	0	0	0	2	0	0	0	0	0	1	1	0	0
CO5	2	1	0	0	0	0	0	0	0	0	0	1	1	0	0
AVG	2	1.6	2	0	0	1.7	2	0	0	0	0	1.4	1	0	0
Course Code	FPS(15ME72)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	0	0	0	0	0	0	1	0	1	1	1	0
CO2	3	2	2	0	0	0	0	0	1	1	0	2	1	1	0
CO3	3	2	2	0	0	0	0	0	1	1	0	1	2	1	0
CO4	3	2	2	0	0	0	0	0	1	1	0	1	2	2	0
CO5	3	2	2	0	0	0	0	0	0	1	0	1	2	2	0
AVG	3	2	2	0	0	0	0	0	1	1	0	1.2	1.6	1.4	0
Course Code	CE(15ME73)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	2	0	0	0	0	0	0	0	2	3	2	3
CO2	3	2	2	2	0	0	0	0	0	0	0	2	3	2	3
CO3	3	2	2	2	0	0	0	0	0	0	0	1	3	2	3
CO4	3	3	3	2	0	0	0	0	0	0	0	1	3	2	3
CO5	3	3	3	2	0	0	0	0	0	0	0	2	3	2	2

Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	0	0	0	1	1	0	1	0	2	0	1	1	0	0
CO2	2	0	0	2	1	1	0	1	0	2	0	1	1	0	0
CO3	2	0	0	0	1	1	0	1	0	2	0	1	1	0	0
CO4	2	0	0	0	1	1	0	1	0	2	0	1	1	0	0
CO5	2	0	0	0	1	1	0	1	0	2	0	1	1	0	0
AVG	2	0	0	2	1	1	0	1	0	2	0	1	1	0	0
Course Code	IS(15ME662)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	0	0	0	2	1	0	2	0	2	1	0	2	0
CO2	3	2	0	0	0	2	1	0	2	0	2	1	0	2	0
CO3	3	2	0	0	0	2	1	0	2	0	2	1	0	2	0
CO4	3	2	0	0	0	2	1	0	2	0	2	1	0	2	0
CO5	3	2	0	0	0	2	1	0	2	0	2	1	0	2	0
AVG	3	2	0	0	0	2	1	0	2	0	2	1	0	2	0
Course Code	HT LAB(15MEL67)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	0	0	0	0	0	0	0	0	0	0	0	2	2
CO2	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0
CO3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0
CO4	3	1	0	0	0	0	0	0	0	0	0	1	0	0	0
CO5	3	1	0	0	1	0	0	0	0	0	0	1	0	0	0
AVG	3	1	0	0	1	0	0	0	0	0	0	1	0	2	2
Course Code	CAMA Lab(15MEL68)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	3	3	0	0	0	0	0	0	0	2	2	1
CO2	3	3	2	3	3	0	0	0	0	0	0	0	2	2	1
CO3	3	3	2	3	3	0	0	0	0	0	0	0	3	3	3
CO4	3	3	2	3	3	0	0	0	0	0	0	0	3	3	3
CO5	3	3	2	3	3	0	0	0	0	0	0	0	3	3	3
AVG	3	3	1.8	3	3	0	0	0	0	0	0	0	2.6	2.6	2.2
Course Code															
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
AVG															

VIII SEMESTER

Course Code	OR(15ME81)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	0	0	0	1	1	0	1	3	0	1	1	1	0
CO2	3	3	0	0	0	1	1	0	1	3	0	1	1	1	0
CO3	3	3	0	0	0	1	1	0	1	3	0	1	1	1	0
CO4	3	3	0	0	0	1	1	0	1	3	0	1	1	1	0
CO5	3	3	0	0	0	1	1	0	1	3	0	1	1	1	0
AVG	3	3	0	0	0	1	1	0	1	3	0	1	1	1	0
Course Code	AM(15ME82)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	0	0	1	1	0	0	0	1	0	1	3	1	1
CO2	3	2	0	0	1	1	0	0	0	1	0	1	3	1	1
CO3	3	2	0	0	1	1	0	0	0	1	0	1	3	1	1
CO4	3	2	0	0	1	1	0	0	0	1	0	1	3	1	1
CO5	3	2	2	0	1	1	0	0	0	1	0	1	3	2	1

AVG	3	2.4	2.4	2	0	0	0	0	0	0	0	1.6	3	2	2.8
Course Code	Trobology(15ME742)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3					1		1		2		2	1		2
CO2	3	1	1					1		2		2	1	1	1
CO3	3	2	1					1	2	1		1	2	1	1
CO4	3	2	1					1	2	1		1	2	1	1
CO5	3	1	1			1		1		1		1	2		2
AVG	3	1.5	1	0	0	1	0	1	2	1.4	0	1.4	1.6	1	1.4
Course Code	MTR (15ME753)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	2	3	2	0	0	0	3	0	2	1	1	1
CO2	3	2	2	2	3	2	0	0	2	0	0	1	0	1	0
CO3	3	2	3	1	2	1	0	0	0	2	0	2	1	0	2
CO4	3	3	1	2	2	0	0	0	0	1	0	1	0	2	0
CO5	3	2	2	2	3	0	0	0	3	3	0	2	1	0	1
AVG	3	2.2	2.2	1.8	2.6	1.7	0	0	2.5	2.3	0	1.6	1	1.3	1.3
Course Code	Design Lab(15MEL76)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	0	1	0	0	0	0	0	0	3	2	2
CO2	3	2	3	1	0	1	0	0	0	0	0	0	3	2	2
CO3	2	2	3	3	0	1	0	0	0	0	0	0	3	2	2
CO4	2	2	3	1	0	1	0	0	0	0	0	0	3	3	3
CO5	2	2	3	1	0	1	0	0	0	0	0	0	3	3	3
AVG	2.4	2.2	3	1.8	0	1	0	0	0	0	0	0	3	2.4	2.4
Course Code	CIM LAB(15MEL77)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	0	3	0	2	0	0	0	0	0	0	3	3	2
CO2	3	3	0	3	0	2	0	0	0	0	0	0	3	3	2
CO3	3	3	0	3	3	3	0	0	0	2	0	3	3	3	3
CO4	2	2	0	2	2	2	0	0	0	2	0	3	2	2	3
CO5	2	2	0	2	2	2	0	0	0	2	0	3	2	2	3
AVG	2.6	2.6	0	2.6	2.3	2.2	0	0	0	2	0	3	2.6	2.6	2.6

AVG	3	2	2	0	1	1	0	0	0	1	0	1	3	1.2	1
Course Code	PLM(15ME835)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	0	0	0	0	0	0	1	1	1	0	1	1	1	0
CO2	2	0	0	0	0	0	0	1	1	1	0	1	1	1	0
CO3	2	0	0	0	0	0	0	1	1	1	0	1	1	1	0
CO4	2	0	0	0	0	0	0	1	1	1	0	1	1	1	0
CO5	2	0	0	0	0	0	0	1	1	1	0	1	1	1	0
AVG	2	0	0	0	0	0	0	1	1	1	0	1	1	1	0
Course Code	Internship(15ME84)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	0	0	1	0	0	0	2	1	1	2	0	0	0
CO2	1	1	0	0	1	0	2	0	2	1	0	2	0	0	0
CO3	1	1	0	0	1	0	0	1	3	3	2	2	0	0	0
CO4	0	0	0	0	2	0	0	0	3	2	1	2	0	0	0
CO5	0	0	0	0	2	0	0	0	3	2	1	2	0	0	0
AVG	1	1	0	0	1.4	0	2	1	2.6	1.8	1.3	2	0	0	0
Course Code	Project Phase II(15ME85)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	0	2	0	1	2	0	2	2	0	3	1	1	1
CO2	3	2	2	0	0	0	0	3	3	3	2	3	0	0	0
CO3	0	0	2	0	0	0	0	0	3	2	2	3	0	0	0
CO4	0	3	2	2	2	0	0	0	2	3	3	3	3	1	3
CO5	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
AVG	3	2.5	2	2	2	1	2	3	2.5	2.5	2.3	3	2	1	2
Course Code	Seminar(15ME86)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	0	3	0	0	0	0	0	0	0	3	3	3	0
CO2	3	3	0	3	0	0	0	0	0	0	0	3	3	0	0
CO3	3	3	0	0	0	0	0	0	0	3	0	3	3	0	0
CO4	3	3	0	3	3	0	0	0	3	3	0	3	3	0	0
CO5	0	0	0	0	0	0	0	3	0	0	0	3	0	3	0
AVG	3	3	0	3	3	0	0	3	3	3	0	3	3	3	0

III SEMESTER

Course Code	ENGINEERING MATHEMATICS (17MAT31)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	1	2	2	2	1	1	2	2	3	1	2	0
CO2	3	3	3	2	2	2	2	1	1	2	2	3	2	2	0
CO3	3	3	3	1	1	1	1	1	1	1	1	3	2	3	0
CO4	3	3	3	2	2	2	2	1	2	2	2	3	3	2	0
CO5	3	3	3	2	2	2	2	1	2	2	2	3	3	2	0
AVG	3	3	3	1.6	1.8	1.8	1.8	1	1.4	1.8	1.8	3	2.2	2.2	0

Course Code	MSM(17ME32)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	0	0	1	1	0	0	1	0	1	1	1	0
CO2	3	2	2	0	0	1	1	0	0	0	0	1	1	1	0
CO3	3	2	0	0	0	0	0	0	0	0	1	1	1	1	0
CO4	3	2	2	0	0	2	0	0	0	0	0	1	1	1	0
CO5	3	2	2	0	0	1	0	0	0	0	0	1	1	1	0
AVG	3	2.2	2	0	0	1.3	1	0	0	1	1	1	1	1	0

Course Code	BTD(17ME33)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2			1	1			1		1	1	1	
CO2	3	2	2			1	1					1	1	1	
CO3	3	2									1	1	1	1	
CO4	3	2	2			2						1	1	1	
CO5	3	2	2			1						1	1	1	
AVG	3.0	2.4	2.0	0.0	0.0	1.1	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0

Course Code	MOM(17ME34)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	0	0	1	1	1	0	0	0	1	3	0	0
CO2	3	3	1	0	0	1	1	1	0	0	0	1	3	0	0
CO3	3	3	1	0	0	1	1	1	0	0	0	1	3	0	0
CO4	3	3	2	0	0	1	1	1	0	0	0	1	3	0	0
CO5	3	3	2	0	0	1	1	1	0	0	0	1	3	0	0
AVG	3	3	1.6	0	0	1	1	1	0	0	0	1	3	0	0

Course Code	MCW(17ME35)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	0	1	2	1	1	0	0	1	0	1	3	2	2
CO2	3	0	0	0	2	1	1	0	0	1	0	1	3	1	2
CO3	3	0	0	0	2	1	0	0	0	1	0	1	3	1	2
CO4	3	0	0	1	2	1	1	0	0	1	0	1	3	2	2
CO5	3	0	0	1	2	1	1	0	0	1	0	1	3	2	2
AVG	3	0	0	1	2	1	1	0	0	1	0	1	3	1.6	2

Course Code	CAMD(17ME36)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
AVG	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0

Course Code	Materials Testing Laboratory(17MEL37)

IV SEMESTER

Course Code	ENGINEERING MATHEMATICS(17MAT41)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3										2	3	2	
CO2	3	3	2	1								2	3	3	
CO3	2	3	3	2								2	3	3	
CO4	2	3	3	2								2	3	3	
CO5		3	3	3								2	3	3	
AVG	2.5	3	2.8	2	0	0	0	0	0	0	0	2	3	2.8	0

Course Code	KOM(17ME42)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	0	0	0	1	2	1	0	1	0	2	1	0	2
CO2	3	3	2	0	0	0	2	1	0	1	0	1	1	0	2
CO3	2	2	0	0	0	2	0	1	0	1	0	2	1	0	2
CO4	2	1	0	0	0	2	0	1	0	1	0	1	1	0	2
CO5	2	1	0	0	0	0	0	1	0	1	0	1	1	0	2
AVG	2	1.6	2	0	0	1.7	2	1	0	1	0	1.4	1	0	2

Course Code	ATD(17ME43)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2					2		1			1		
CO2	3	2	2					2		1			1		
CO3	3	2	2					2		1			1		
CO4	3	2	2					2		1			1		
CO5	3	2	2					2		1			1		
AVG	3	2	2	0	0	0	0	2	0	1	0	0	1	0	0

Course Code	FM(17ME44)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3										2	2		
CO2	3	3										2	2		
CO3	3	3	2									2	2		
CO4	3	3	2									2	2		
CO5	3	2	1		1							2	2		
AVG	3	2.8	1.7	0	1	0	0	0	0	0	0	2	2	0	0

Course Code	MTO(17ME45)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	0	0	0	1	1	0	0	1	0	1	3	2	1
CO2	3	3	0	0	0	1	1	0	0	1	0	1	3	3	1
CO3	3	2	0	0	0	1	1	0	0	1	0	1	3	3	1
CO4	3	2	2	0	0	1	1	0	0	1	0	1	3	3	1
CO5	3	2	2	0	0	1	1	0	0	1	0	1	3	3	1
AVG	3	2.3	2	0	0	1	1	0	0	1	0	1	3	2.8	1

Course Code	MMM(17ME46)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	0	0	0	1	2	1	0	1	0	2	1	0	2
CO2	3	3	2	0	0	0	2	1	0	1	0	1	1	0	2
CO3	3	2	0	0	0	2	0	1	0	1	0	2	1	0	2
CO4	3	1	0	0	0	2	0	1	0	1	0	1	1	0	2
CO5	3	1	0	0	0	0	0	1	0	1	0	1	1	0	2
AVG	3	1.6	2	0	0	1.7	2	1	0	1	0	1.4	1	0	2

Course Code	MMM LAB(17MEL47)

Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
AVG	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
Course Code	FF LAB(17MEL38)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
AVG	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0

Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
AVG	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
Course Code	MC SHOP(17MEL48)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
AVG	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0

V SEMESTER

Course Code	M&E(17ME51)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2					1		1		3		3	1		1
CO2	2					2			3	3		3	1		1
CO3	2	2				2			2	3		3	1		1
CO4	3	2			1			1	1	3		3	1		1
CO5	3	2			1			1	1	3		3	1		1
AVG	2.4	2	0	0	1	1.7	0	1	1.8	3	0	3	1	0	1
Course Code	DOM(17ME52)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	0	3	1	0	1	0	0	0	1	3	3	2
CO2	3	3	1	0	3	1	0	1	0	0	0	1	1	2	2
CO3	3	3	1	0	2	1	0	1	0	0	0	1	3	3	3
CO4	3	3	2	0	0	1	0	1	0	0	0	1	2	3	2
CO5	3	3	2	0	0	1	0	1	0	0	0	1	3	3	3
AVG	3	3	1.4	0	2.7	1	0	1	0	0	0	1	2.4	2.8	2.4
Course Code	TM(17ME53)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1		0	0					1			
CO2	3	2	2	1		0	0					1			
CO3	3	2	2	2		1	1					1			
CO4	3	2	2	2		1	1					1			
CO5	3	2	2	2		1	1					1			
AVG	3	2	2	1.6	0	1	1	0	0	0	0	1	0	0	0
Course Code	DME1(17ME54)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	3	0	0	2	3	3	0	0	3	2	3	2	0
CO2	3	3	3	2	0	2	1	3	2	0	3	2	3	2	0
CO3	3	3	3	2	0	2	1	3	2	0	3	2	3	2	0
CO4	3	3	3	2	0	2	1	3	2	0	3	2	3	2	0
CO5	3	3	3	2	0	2	1	3	2	0	3	2	3	2	0
AVG	2.6	2.6	3	2	0	2	1.4	3	2	0	3	2	3	2	0
Course Code	NTM(17ME551)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	0	0	0	1	0	2	0	2	0	2	1	0	1
CO2	3	0	0	0	1	2	1	2	0	2	0	2	1	0	1
CO3	3	0	0	0	1	2	1	2	0	2	0	2	1	0	1

VI SEMESTER

Course Code	FEM(17ME61)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	0	0	0	0	0	1	0	0	0	1	2	1	1
CO2	3	2	1	1	0	0	0	1	0	0	0	1	2	1	2
CO3	3	2	1	1	0	0	0	1	0	0	0	1	2	2	2
CO4	3	2	1	1	1	0	0	1	0	0	0	1	2	1	2
CO5	3	2	1	0	1	0	0	1	0	0	0	1	2	1	2
AVG	3	2	1	1	1	0	0	1	0	0	0	1	2	1.2	1.8
Course Code	CIM(17ME62)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1				1	2					2	1		2
CO2	3	3	2				2					1	1		2
CO3	2	2				2						2	1		2
CO4	2	1				2						1	1		2
CO5	2	1										1	1		2
AVG	2.0	1.8	2.0	0.0	0.0	1.7	2.0	0.0	0.0	0.0	0.0	1.5	1.0	0.0	2.0
Course Code	HT(17ME63)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
AVG	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
Course Code	DME2(17ME64)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2		2	3	3	3	2	3	3	3	2	
CO2	3	3	3	2		2	1	3	3	2	3	3	3	2	
CO3	3	3	3	2		2	1	3	3	2	3	3	3	2	
CO4	3	3	3	2		2	1	3	3	3	3	3	3	2	
CO5	3	3	3	2		2	1	3	3	3	3	3	3	2	
AVG	3	3	3	2	0	2	1.4	3	3	2.4	3	3	3	2	0
Course Code	MF (17ME653)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	2	3	2				3	3	2	1	3	2	2
CO2	2	2	1												2
CO3	2	1	2												1

CO4	3	0	0	0	1	1	1	2	0	2	0	2	1	0	1
CO5	3	0	0	0	1	1	1	2	0	2	0	2	1	0	1
AVG	3	0	0	0	1	1.4	1	2	0	2	0	2	1	0	1
Course Code	A&R(17ME563)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	0	0	0	1	2	1	0	1	0	2	1	0	2
CO2	3	3	2	0	0	0	2	1	0	1	0	1	1	0	2
CO3	2	2	0	0	0	2	0	1	0	1	0	2	1	0	2
CO4	2	1	0	0	0	2	0	1	0	1	0	1	1	0	2
CO5	2	1	0	0	0	0	0	1	0	1	0	1	1	0	2
AVG	2.4	1.6	2	0	0	1.7	2	1	0	1	0	1.4	1	0	2
Course Code	OOPS (17CS563)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3							1				2	3		
CO2	3	2						1				2	3		
CO3	3						3	2				2	3		
CO4	3						3	2				2	2		
CO5	2						3	2				2	2		
AVG	2.8	2	0	0	0	0	3	1.6	0	0	0	2	2.6	0	0
Course Code	TOE(17MEL552)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	0	0	0	0	0	0	1	1	0	1	1	1	0
CO2	3	2	0	0	0	0	0	0	1	1	0	1	1	1	0
CO3	3	2	2	1	0	0	0	0	1	0	0	1	1	1	0
CO4	3	2	2	1	0	0	0	1	1	0	0	1	1	1	1
CO5	3	2	2	1	0	0	0	1	1	0	0	1	1	1	1
AVG	3	2	2	1	0	0	0	1	1	1	0	1	1	1	1
Course Code	E&E(17ME562)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3							1				2	3		
CO2	3	2						1				2	3		
CO3	3						3	2				2	3		
CO4	3						3	2				2	2		
CO5	2						3	2				2	2		
AVG	2.8	2	0	0	0	0	3	1.6	0	0	0	2	2.6	0	0
Course Code	FM LAB(17MEL57)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
AVG	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
Course Code	ECLAB(17MEL58)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
AVG	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
VII SEMESTER															

CO4	2	2	1										2	2	1
CO5	2	1	2										2	1	1
AVG	1.8	1.4	1.6	3	2	0	0	0	3	3	2	1	2.3	1.7	1.4
Course Code	AE (17ME655)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
AVG	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
Course Code	IS (17ME662)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	0	0	0	2	1	0	2	0	2	1	0	2	0
CO2	3	2	0	0	0	2	1	0	2	0	2	1	0	2	0
CO3	3	2	0	0	0	2	1	0	2	0	2	1	0	2	0
CO4	3	2	0	0	0	2	1	0	2	0	2	1	0	2	0
CO5	3	2	0	0	0	2	1	0	2	0	2	1	0	2	0
AVG	3	2	0	0	0	2	1	0	2	0	2	1	0	2	0
Course Code	HTLAB (17MEL67)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	0	0	0	0	0	0	0	0	0	0	2	2	0
CO2	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0
CO3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0
CO4	3	1	0	0	0	0	0	0	0	0	0	1	0	0	0
CO5	3	1	0	0	1	0	0	0	0	0	0	1	0	0	0
AVG	3	1	0	0	1	0	0	0	0	0	0	0	2	2	0
Course Code	CAMA(17MEL68)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3			1				1		1		1	1		
CO2	3			3	1	1		1		3			2		
CO3	3			1	1	1		1		1		1	2		
CO4	3			2						2		1	2		
CO5	3			2						2		1	2		
AVG	3	0	0	1.8	1	1	0	1	0	1.8	0	1	1.8	0	0
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1													3	2	3
CO2													3	2	3
CO3													3	2	3
CO4													3	2	3
CO5													3	2	3
AVG															
VIII SEMESTER															
Course Code	OR(17ME81)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	0	0	1	1	0	0	1	0	1	1	1	0
CO2	3	2	2	0	0	1	1	0	0	0	0	1	1	1	0
CO3	3	2	0	0	0	0	0	0	0	0	1	1	1	1	0
CO4	3	2	2	0	0	2	0	0	0	0	0	1	1	1	0
CO5	3	2	2	0	0	1	0	0	0	0	0	1	1	1	0
AVG	3	2.2	2	0	0	1.3	1	0	0	1	1	1	1	1	0
Course Code	AM(17ME82)														

Course Code	EE(17ME71)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	0	0	0	1	2	0	0	0	0	2	1	0	2
CO2	3	3	2	0	0	0	2	0	0	0	0	1	1	0	2
CO3	2	2	0	0	0	2	0	0	0	0	0	2	1	0	2
CO4	2	1	0	0	0	2	0	0	0	0	0	1	1	0	2
CO5	2	1	0	0	0	0	0	0	0	0	0	1	1	0	2
AVG	2	1.6	2	0	0	1.7	2	0	0	0	0	1.4	1	0	2
Course Code	FPS(17ME72)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3								1		2	2	1	1
CO2	3	3	2		2					1		2	2	1	
CO3	3	3	2		2					1		2	2	1	
CO4	3		2		2					1		2	2	1	
CO5	3		2		2					1		2	2	1	1
AVG	3	3	2	0	2	0	0	0	0	1	0	2	2	1	1
Course Code	CE(17ME73)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	0	0	0	0	0	1	0	0	0	2	2	2	3
CO2	3	2	1	0	0	0	0	1	0	0	0	2	3	2	3
CO3	3	3	1	0	0	0	0	1	0	0	0	1	3	3	3
CO4	3	2	1	0	0	0	0	1	0	0	0	1	2	2	3
CO5	3	3	1	0	0	0	0	1	0	0	0	2	1	1	2
AVG	2.8	2.2	1	0	0	0	0	1	0	0	0	1.6	2.2	2	2.8
Course Code	TRIBOLOGY(17ME745)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	0	0	0	1	0	1	0	2	0	2	1	0	2
CO2	3	1	1	0	0	0	0	1	0	2	0	2	1	1	1
CO3	3	2	1	0	0	0	0	1	2	1	0	1	2	1	1
CO4	3	2	1	0	0	0	0	1	2	1	0	1	2	1	1
CO5	3	1	1	0	0	1	0	1	0	1	0	1	2	0	2
AVG	3	1.5	1	0	0	1	0	1	2	1.4	0	1.4	1.6	1	1.4
Course Code	FMN(17ME743)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2			1	2		1		2		3	1		1
CO2	2	2				2			3	3		3	1		1
CO3	2	2				2			2	3		3	1		1
CO4	3	2			1			1	1	3		3	1		1
CO5	3	2			1			1	1	3		3	1		1
AVG	2.4	2	0	0	1	2	0	1	1.8	2.8	0	3	1	0	1
Course Code	SM(17ME746)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	0	0	1	1	0	0	1	0	1	1	1	0
CO2	3	2	2	0	0	1	1	0	0	0	0	1	1	1	0
CO3	3	2	0	0	0	0	0	0	0	0	1	1	1	1	0
CO4	3	2	2	0	0	2	0	0	0	0	0	1	1	1	0
CO5	3	2	2	0	0	1	0	0	0	0	0	1	1	1	0
AVG	3	2.2	2	0	0	1.3	1	0	0	1	1	1	1	1	0
Course Code	MTR(17ME754)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	0	0	2	1	1	1	0	1	1	0	0	0	0
CO2	2	2	1	0	0	1	0	1	0	1	1	0	0	0	0
CO3	3	0	2	1	2	1	0	1	0	1	1	0	0	0	0
CO4	2	3	0	0	2	0	2	1	0	1	1	0	0	0	0
CO5	3	2	0	2	2	0	0	1	0	1	1	0	0	0	0
AVG	2.6	2.3	1.5	1.5	2	1	1.5	1	0	1	1	0	0	0	0

Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2			1	1				1		1	3	1	1
CO2	3	2			1	1				1		1	3	1	1
CO3	3	2			1	1				1		1	3	1	1
CO4	3	2			1	1				1		1	3	1	1
CO5	3	2	2		1	1				1		1	3	2	1
AVG	3	2	2	0	1	1	0	0	0	1	0	1	3	1.2	1
Course Code	PLM(17ME83)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	0	0	1	1	0	0	1	0	1	1	1	0
CO2	3	2	2	0	0	1	1	0	0	0	0	1	1	1	0
CO3	3	2	0	0	0	0	0	0	0	0	1	1	1	1	0
CO4	3	2	2	0	0	2	0	0	0	0	0	1	1	1	0
CO5	3	2	2	0	0	1	0	0	0	0	0	1	1	1	0
AVG	3	2.2	2	0	0	1.3	1	0	0	1	1	1	1	1	0
Course Code	INTERNSHIP(17ME84)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	0	0	1	0	0	0	2	1	1	2	0	0	0
CO2	1	1	0	0	1	0	2	0	2	1	0	2	0	0	0
CO3	1	1	0	0	1	0	0	1	3	3	2	2	0	0	0
CO4	0	0	0	0	2	0	0	0	3	2	1	2	0	0	0
CO5	0	0	0	0	2	0	0	0	3	2	1	2	0	0	0
AVG	1	1	0	0	1.4	0	2	1	2.6	1.8	1.3	2	0	0	0
Course Code	PROJECT/PHASE2 (17ME85)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	0	2	0	1	2	0	2	2	0	3	1	1	1
CO2	3	2	2	0	0	0	0	3	3	3	2	3	0	0	0
CO3	0	0	2	0	0	0	0	0	3	2	2	3	0	0	0
CO4	0	3	2	2	2	0	0	0	2	3	3	3	3	1	3
CO5	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
AVG	3	2.5	2	2	2	1	2	3	2.5	2.5	2.3	3	2	1	2
Course Code	SEMINAR(17MES86)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	0	3	0	0	0	0	0	0	0	3	3	3	0
CO2	3	3	0	3	0	0	0	0	0	0	0	3	3	0	0
CO3	3	3	0	0	0	0	0	0	0	0	0	3	3	0	0
CO4	3	3	0	3	3	0	0	0	3	3	0	3	3	0	0
CO5	0	0	0	0	0	0	0	3	0	0	0	3	0	3	0
AVG	3	3	0	3	3	0	0	3	3	3	0	3	3	3	0
Course Code															
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
AVG															

Course Code	CIM LAB (17MEL76)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	0	3	0	2	2	3	0	0	0	0	3	3	2
CO2	3	3	0	3	0	2	0	0	0	0	0	0	3	3	2
CO3	3	3	0	3	3	3	3	3	0	2	0	3	3	3	3
CO4	3	2	0	2	2	2	3	2	0	2	0	3	2	2	3
CO5	3	2	0	2	2	2	3	2	0	2	0	3	2	2	3
AVG	3	2.6	0	2.6	2.3	2.2	2.8	2.5	0	2	0	3	2.6	2.6	2.6
Course Code	DESIGN LAB (17MEL77)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	0	1	0	0	0	0	0	0	3	2	2
CO2	3	2	3	1	0	1	0	0	0	0	0	0	3	2	2
CO3	2	2	3	3	0	1	0	0	0	0	0	0	3	2	2
CO4	2	2	3	1	0	1	0	0	0	0	0	0	3	3	3
CO5	2	2	3	1	0	1	0	0	0	0	0	0	3	3	3
	2.4	2.2	3	1.8	0	1	0	0	0	0	0	0	3	2.4	2.4
Course Code															
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
AVG															
Course Code															
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
AVG															

Course Code	
Course Title	17 MAT 31
	TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES
CO1	
CO2	Know the use of periodic signals and fourier series to analyse circuits and system communications.
CO3	Explain the general linear system theory for continous-time signals and digital signal processing using the Fourier Transform
CO4	Employ appropriate numerical methods to solve algebraic and transcendental equations
CO5	Apply Green's theorem, Divergence theorem and Stoke's theorem in variouys applications in the field of electro- magnetic and gravtitaional fields and fluid flow problems.
Course Code	17ME32
Course Title	MSM
	This course will enable students to;
CO1	Describe the mechanical properties of metals, their alloys and various modes of failure.
CO2	Understand the microstructures of ferrous and non-ferrous materials to mechanical properties.
CO3	further to use the available of results to draw shear force and bending moment diagrams.
CO4	Explain the processes of heat treatment of various alloys.
CO5	Understand the properties and potentialities of various materials available and material selection procedures.
Course Code	17 ME 33
Course Title	BTD
	This course will enable students to;
CO1	Understand and apply the concepts of TD temperature scales work, and heat interactions for different types of systems by solving problems with relevant units.

CO2	Illustrate the different forms of work to flow & non flow process by applying 1st Law & 2nd law of Thermodynamics
CO3	Calculations of entropy by applying TdS relations, for a reversible and irreversible processes derived from second law of thermodynamics
CO4	Problem solving procedures related to pure substances using PT, PV, TH diagrams and its applications, discussing the available and un available energy by different laws/relations
CO5	Discussing the Thermodynamics Properties and solving problems on Ideal gas and its mixtures. Also real gases at all ranges of pressure, temperatures using Vander Waals equation, Redlich Wong equation and Beattie
Course Code	17 ME 34
Course Title	MOM
	This course will enable students to;
CO1	Understand simple, compound, thermal stresses and strains their relations, Poisson's ratio, Hooke's law, mechanical properties including elastic constants and their relations and to determine stresses, strains and deformations in bars with varying circular and rectangular cross sections subjected to normal and temperature loads.
CO2	Determine plane stress, principal stress, maximum shear stress and their orientations using analytical method and Mohr's circle and also stress distribution in thick and thin cylinders.
CO3	Draw SFD and BMD for different beams including cantilever beams, simply supported beams and overhanging beams subjected to UDL, UVL, Point loads and couples and to determine dimensions, bending stress, shear stress and its distribution in beams of circular, rectangular, symmetrical I and T sections subjected to point loads and UDL.
CO4	Determine the dimensions of shafts based on tensional strength, rigidity and flexibility and also elastic stability of columns using Rankin's and Euler's theory.
CO5	Explain the theories of failure and to determine the strain energy due to normal stress, shear stress, bending and torsion.
Course Code	17 ME 35
Course Title	MCW
	This course will enable students to;
CO1	To impart knowledge to the students on the basic concepts of Manufacturing and sand Casting

	process
CO2	To enrich knowledge about special casting processes and principle of various melting furnaces.
CO3	To illustrate the solidification process and casting of non – ferrous metals.
CO4	To introduce the students the concepts of Conventional and special welding processes and their field of applications.
CO5	To acquire the knowledge on quality test methods conducted for casting and welded components.
Course Code	17 ME 36
Course Title	CAMD
	This course will enable students to;
CO1	Understand and draw the section of solids and conversion of isometric views of machine parts in to orthographic views
CO2	Able to understand and draw the sectional views of threads of ISO Metric,BSW,Square and Acme threads in 2D
CO3	Understand and draw the types of Keys as per the ISO standards in 2D Understand and draw single and double riveted joints
CO4	Able to understand and draw cotter and knuckle joint for two rods in 2D and split muff, protected type flanged, pin type flexible, Oldham's and universal couplings in 2D
CO5	Analyse, understand and draw assemblies from the part drawings with limits ,fits and tolerance given for Plummer block, Ram bottom safety valve, I.C. Engine connecting rod, Screw Jack, Tailstock of lathe, Machine Vice and Lathe square tool post in 2D and 3D
Course Code	17 MEL 37
Course Title	MATERIALS TESTING LABORATORY
	This course will enable students to;
CO1	Understand specimen preparation for metallographic examination, microstructures and heat treatment processes.
CO2	Understand wear characteristics of ferrous , non ferrous and composite material and learn about non destructive testing experiments.

CO3	Operate Universal Testing Machine for tensile, shear and compression tests of metallic and non metallic specimens and evaluate their properties.
CO4	Operate Universal Testing Machine for bending tests of metallic and non metallic specimens and evaluate their mechanical properties.
CO5	Evaluate hardness of M.S, C.I Specimen by conducting Izod , Charpy, Brinell, Rockwell and Vicker's hardness tests.
Course Code	17 MEL 38
Course Title	FF LAB
	This course will enable students to;
CO1	Analyze and optimize foundry sand, core sand to a particular application.
CO2	Build moulds with or without patterns.
CO3	Understand casting of ferrous and non ferrous objects.
CO4	Develop skills in making forging models manually
CO5	Develop skills in making forging models with the help of power hammers
Course Code	17 MAT 41
Course Title	COMPLEX ANALYSIS, PROBABILITY AND STATISTICAL METHODS
CO1	Apply complex numbers to determine continuity/ differentiability/ analiticity of a function.
CO2	Identify the transformation and evaluate a contour intergral using Cauchy's integral formula.
CO3	Classify the random variables to determine the appropriate probability distributions
CO4	Use correlation and regression analysis to fit a suitable mathematical model for the statistical data
CO5	Detremine the joint probability distribution,its mean, variance and covariance.
Course Code	17 ME 42

Course Title	KOM
	This course will enable students to;
CO1	Identify mechanisms with basic understanding of motion.
CO2	Comprehend motion analysis and Carry out motion analysis of planar mechanisms by graphical method.
CO3	Comprehend motion analysis and Carry out motion analysis of planar mechanisms by analytical method
CO4	Comprehend motion analysis and Carry out motion analysis of gears and gear trains.
CO5	Comprehend motion analysis and Carry out motion analysis of cams
Course Code	17 ME 43
Course Title	ATD
	This course will enable students to;
CO1	Apply thermodynamic concepts to analyze the performance of gas power cycles and jet propulsion and evaluate performance of Brayton cycle
CO2	Apply thermodynamic concepts to analyze the performance of vapour power cycles.
CO3	Apply thermodynamic concepts to analyze the performance of IC Engines and combustion engg
CO4	Explore the principles, applications and COP of refrigeration systems and Air conditioners
CO5	Apply Thermodynamic concepts to determine performance parameters of Air compressors and Steam nozzles
Course Code	17 ME 44
Course Title	FM
	This course will enable students to;
CO1	Understand the properties of fluids, fluid behaviour and flotation of bodies
CO2	Comprehend various types of fluid flow, transformation of fluid energy to mechanical energy and measurement of fluid flow

CO3	Understand the basic concept of Laminar flow, turbulent flow and Energy consideration in pipe flow
CO4	Understand the concept of boundary layer, concept of lift and drag in fluid flow and apply dimensional analysis to form dimensionless numbers in terms of input output variables.
CO5	Understand the basic concept of compressible flow and CFD
Course Code	17 ME 45
Course Title	MTO
CO1	To understand the construction and specification of different machine tools
CO2	To gain knowledge pertaining to relative motion and mechanics required for various machine tools
CO3	To develop knowledge of cutting tool materials and geometry of cutting tools
CO4	To apply mechanics of machining process and effect of various parameters on economics of machining
CO5	To analyze the wear and tear of cutting tools and economics of machining process
Course Code	17 ME 46
Course Title	MMM
CO1	Understand the objectives of metrology, methods of measurement, selection of measuring instruments, standards of measurement and calibration of end bars. Describe slip gauges, wringing of slip gauges and building of slip gauges, angle measurement using sine bar, sine center, angle gauges, optical instruments and straightness measurement using Autocollimator.
CO2	Explain tolerance, limits of size, fits, geometric and position tolerances, gauges and their design.
CO3	Understand the principle of Johnson Mikrokator, sigma comparator, dial indicator, LVDT, back pressure gauges, Solex comparators and Zeiss Ultra Optimeter
CO4	Explain measurement systems, transducers, intermediate modifying devices and terminating devices.

CO5	Describe functioning of force, torque, pressure, strain and temperature measuring devices.
Course Code	17 MEL 47
Course Title	MMM LAB
	This course will enable students to;
CO1	Calibrate different instruments
CO2	Apply the concept of measuring thread profile of different components in mechanical engineering industry.
CO3	Evaluate Angular measurement of Various entities.
CO4	Evaluate force of components using measuring devices.
CO5	Evaluate surface irregularities of components using measuring devices.
Course Code	17 MEL 48
Course Title	M/CSHOP
	This course will enable students to;
CO1	Operate lathe machine tool for various turning operations in a given cylindrical specimen.
CO2	Operate shaping machine for various machining operations in a given cubical specimen.
CO3	Operate shaping machine for various machining operations in a given cubical specimen.
CO4	Operate shaping machine for various machining operations in a given cubical specimen.
CO5	Operate milling machine for producing a spur gear in a given blank diameter or the number of teeth through simple indexing procedures.
Course Code	17 ME 51
Course Title	M&E
CO1	Understand needs, scope functions and roles ,scope and evolution of management

CO2	understand importance and purpose of planning, hierarchy of planning, and analyze its types, decision making, organizing, staffing, directing and controlling
CO3	Select the best economic model from the available best alternatives
CO4	Understand various interest rates and impelent the suitable one
CO5	Estimate various depreciation values of commodities
Course Code	17 ME 52
Course Title	DOM
	This course will enable students to;
CO1	Determine the forces and couples for static and dynamic conditions of four bars and slider crank mechanisms to keep the system in equilibrium.
CO2	Determine magnitude and angular position of balancing masses under static and dynamic condition of rotating masses in same and different planes and determine unbalanced primary, secondary forces and couples in single and multi-cylinder engine.
CO3	Determine sensitiveness, isochronisms, effort and power of porter and Hartnell governors. Determine gyroscopic couple and effects related to 2, 4 wheeler, plane disc, ship and aeroplanes.
CO4	Understand types of vibration, SHM and methods of finding natural frequencies of simple mechanical systems.
CO5	Determine equation of motion, natural frequency, damping factor, logarithmic decrement of damped free-vibration (SDOF) systems. Determine equation of motion of rotating and reciprocating unbalance systems, magnification factor, andtransmissibilityof forced vibration (SDOF) systems.
Course Code	17 ME 53
Course Title	TM
CO1	Apply model studies and thermodynamic concepts in solving turbo machines problems
CO2	Learn about methods of energy storage Evaluate turbo machines using concepts of turbine equations and velocity triangles., energy management.
CO3	Analyse and evaluate performance of impulse and reaction steam turbines

CO4	Analyse and evaluate performance of hydraulic turbines
CO5	Analyse and evaluate performance of power absorbing turbo machines
Course Code	17 ME 54
Course Title	DME1
	This course will enable students to;
CO1	Describe the design process, choose materials and Apply the codes and standards in design process.
CO2	Analyze the behavior of machine components under static, impact, fatigue loading using failure theories
CO3	Design shafts, joints, couplings.
CO4	Design of riveted and welded joints.
CO5	Design of threaded fasteners and power screws
Course Code	17 ME 554
Course Title	NTM
	This course will enable students to;
CO1	Understand the compare traditional and non-traditional machining processand recognize the need for Non-traditional machining process.
CO2	Understand the constructional features, performance parameters, process characteristics, applications, advantages and limitations of USM, AJM and WJM.
CO3	Identify the need of Chemical and electro-chemical machining process along with the constructional features, process parameters, process characteristics, applications, advantages and limitations.
CO4	Understand the constructional feature of the equipment, process parameters, process characteristics, applications, advantages and limitations EDM & PAM.
CO5	Understand the LBM equipment, LBM parameters, and characteristics. EBM equipment and mechanism of metal removal, applications, advantages and limitations LBM & EBM
Course Code	17 ME 563

Course Title	A&R
CO1	To identify potential areas for automation and justify need for automation.
CO2	To select suitable major control components required to automate a process or an activity
CO3	To study the various parts of robots and fields of robotics.
CO4	To study the various kinematics and inverse kinematics of robots.
CO5	To study the control of robots for some specific applications.
Course Code	17ME552
Course Title	TOE
	This course will enable students to;
CO1	Understand various types of stresses induced in machine elements under different types of loads.
CO2	Comprehend various types of strains induced in machine elements under different types of loads.
CO3	Analyze the structural members: beams, rotating disks.
CO4	Analyze the torsional rigidity of circular and non-circular sections.
CO5	Analyze the stability of columns and elastic members subjected to thermal loads.
Course Code	17 MEL57
Course Title	FM LAB
CO1	To calibrate different flow measuring devices.
CO2	To estimate head losses in pipes and force developed by impact of jet on vanes.
CO3	To conduct performance tests on power generating turbo machines-Impulse turbine.
CO4	To carry out performance tests on power absorbing turbo machines and positive displacement machine.

CO5	To conduct performance tests on power generating turbo machines-Reaction turbine
Course Code	17 MEL58
Course Title	EC LAB
CO1	Conduct appropriate laboratory experiments and interpret the results
CO2	Analyze and Perform experiments to determine the properties of fuels and various grades oils.
CO3	Analyze and Conduct experiments on engines to draw characteristics curves. Test basic performance parameters of I.C. Engine and implement the knowledge in industry
CO4	Determine the energy flow pattern through the I C Engine and identify exhaust emission, factors affecting them and report the remedies.
CO5	Exhibit his competency towards preventive maintenance of stroke2 IC engines.
Course Code	17CS552
Course Title	OOPS
CO1	
CO2	
CO3	
CO4	
CO5	
Course Code	17 ME 61
Course Title	FEM
	This course will enable students to;
CO1	Understand the concepts of plane stresses and plane strains and basic procedure of FEM. Write an interpolation polynomial for linear, quadratic and cubic elements

CO2	Derive the shape functions and to determine the displacements, reactions and stresses in bars and Trusses by using penalty and elimination approach. Also to analyse the higher order Elements
CO3	Determine the deflection of cantilever, Simply Supported and Fixed Beam. Also to determine the angle of twist in Shafts
CO4	Analyse the temperature distribution applying the boundary conditions like conduction and convection. Also to analyse the flow through pipes of uniform and stepped sections
CO5	Analyse the axisymmetric bodies with triangular elements. Also to Analyse the point mass and limped mass matrix for bar and Truss elements
Course Code	17 ME 62
Course Title	CIM
CO1	To impart knowledge of CIM andAutomation and different concepts of automation by developing mathematical models..
CO2	To make students to understand the Computer Applications in Design and Manufacturing [CAD / CAM) leading to Computer integrated systems. Enable them to perform various transformations of entities on display devices
CO3	To expose students to automated flow lines,assembly lines,Line Balancing Techniques,and Flexible Manufacturing Systems.
CO4	To expose students to computer aided process planning, material requirement planning, capacity planning etc.
CO5	To expose the students to CNC Machine Tools,CNC part programming, and industrial robots and • To introduce the students to concepts of Additive Manufacturing, Internet of Things, and Industry 4.0leading to Smart Factory.
Course Code	17 ME 63
Course Title	HT
CO1	Understand the basic modes of heat transfer to Compute temperature distribution in steady-state and unsteady-state heat conduction
CO2	Analyse the heat transfer through extended surfaces. And transient heat conduction

CO3	Analyse the heat conduction by numerical method and explain the principle of radiation Heat transfer
CO4	Analyse the forced and free convective heat transfer.
CO5	Design of heat exchangers using LMTD, NTU methods and analyse the boiling and condensation
Course Code	17 ME 64
Course Title	DME2
	This course will enable students to;
CO1	Design machine members with different cross sections of curved beams like C, I, H etc., Cylinders and cylinder heads and Mechanical systems involving springs, belts and pulleys
CO2	Design different types of gears (spur, bevel, helical and worm) and simple gear boxes for different applications
CO3	Design brakes and clutches and hydrodynamic bearings for different applications and Select Anti friction bearings for different applications using the manufacturers, catalogue.
CO4	Apply engineering design tools to product design with proficiency to generate production drawings using CAD software.
CO5	Become good design engineers through learning the art of working in a team with morality and ethics.
Course Code	17 ME 653
Course Title	MF
	This course will enable students to;
CO1	Conduct different tests on transformers and evaluate their performance.
CO2	Connect and operate two single phase transformers of different kVA rating in parallel.
CO3	Connect single phase transformers for three phase operation and phase conversion.
CO4	Perform load test on single phase and three phase induction motor to assess its performance.
CO5	Conduct test on induction motor to pre-determine the performance characteristics.
Course Code	17 ME 655

Course Title	AE
	This course will enable students to;
CO1	To identify the different parts of an automobile and its working
CO2	TO understand the working of transmission and braking systems
CO3	To comprehend the working of steering and suspension systems
CO4	To learn various types of fuels and injection systems
CO5	To know the cause of automobile emissions its effects on environment and methods to reduce the emissions
Course Code	17 ME 662
Course Title	IS
	This course will enable students to;
CO1	Able to identify the chemical hazards around work environment. And safe use safe measures in chemical labs and chemical plant.
CO2	Understand the basic safety terms and identify the hazards around the work environment
CO3	Able to identify the hazards and demonstrate the portable extinguishers used for different classes of fires. Identify the sign boards.
CO4	Able to identify the mechanical hazards. Use the safe measures in workshops, machine shops and handling of materials.
CO5	Identify the electrical hazards around work environment. Acquire the knowledge of safe measures while performing work in electric plant, residential building.
Course Code	17 MEL 67
Course Title	HT LAB
	This course will enable students to;
CO1	Perform experiments to determine the thermal conductivity of a metal rod
CO2	Conduct experiments to determine convective heat transfer coefficient for free and forced convection and correlate with theoretical values.

CO3	Estimate the effective thermal resistance in composite slabs and efficiency in pin-fin, and surface emissivity of a test plate
CO4	Estimate performance of a refrigerator and effectiveness of fin
CO5	Calculate temperature distribution of study and transient heat conduction through plane wall, cylinder and fin
Course Code	17 MEL 68
Course Title	CAMALAB
	This course will enable students to;
CO1	Utilize the analysis software to create geometry, discretize, apply boundary condition to solve
CO2	stress related problems on bars, Trusses and plate for different loading conditions
CO3	Demonstrate the deflection of beams subjected to point, uniformly distributed and varying loads
CO4	further to use the available of results to draw shear force and bending moment diagrams.
CO5	Analyze the given problem by applying basic principle to solve and demonstrate 1D and 2D heat
Course Code	17 ME 71
Course Title	EE
	This course will enable students to;
CO1	Understand the basic concepts of thermal energy systems.
CO2	Identify renewable energy sources and their utilization.
CO3	Analyse the concepts of solar radiation and study the working of solar PV and thermal systems.
CO4	Demonstrate principles of energy conversion from alternate sources including wind, tides.
CO5	Illustrate the concepts and applications of fuel cells, biomass, thermoelectric convertor and MHD generator and study of energy storage for specific applications. Concept of green energy.
Course Code	17 ME 72
Course Title	FPS

CO1	To provide an insight into the capabilities of hydraulic and pneumatic fluid power.
CO2	To understand concepts and relationships surrounding force, pressure, energy and power in fluid power systems
CO3	To examine concepts centering on sources of hydraulic power, rotary and linear actuators, distribution systems, hydraulic flow in pipes, andcontrol components in fluid power systems
CO4	Exposure to build and interpret hydraulic and pneumatic circuits related to industrial applications
CO5	To familiarize with logic controls and trouble shooting
Course Code	17 ME 73
Course Title	CE
	Apply system modeling knowledge in implementation of physical system.
CO1	Implement block diagram reduction rules and determine the system transfer function using Signal flow graph.
CO2	Determine time domain response and evaluate the steady state error .
CO3	Determine the and assess the stability of the system.
CO4	Develop and model the system and determine its performance in state space domain
CO5	17 ME 73
Course Code	17 ME 745
Course Title	TRIBOLOGY
CO1	To Describe the fundamentals of tribology and associated parameters.
CO2	To Apply concepts of tribology for the performance analysis and design of components
CO3	experiencing relative motion.

CO4	To Analyse the requirements and design hydrodynamic journal bearings
CO5	for a given application.
Course Code	17 ME 743
Course Title	FM
	This course will enable students to;
CO1	Understand various accounts, taxex , prfeparation of balance sheet
CO2	understand Operating cycle/ cash cycle , calculation of gross working capital and net working capital
CO3	Understand various factors affecting investment decisions, capital budegting
CO4	Able to calculate risk and returns of portfolios, understand various types of financial ratios
CO5	Understand the preparation of cost sheet and variences of cost and preparing various types of budgets
Course Code	17 ME 745
Course Title	SM
CO1	
CO2	
CO3	
CO4	
CO5	
Course Code	17 ME 754
Course Title	MTR

CO1	To provide insight to students on the fundamentals of interdisciplinary
CO2	engineering components and their integration in Mechatronic systems design
CO3	approach.
CO4	To impart the knowledge of Microprocessors, Microcontrollers, and its role in
CO5	Mechatronic systems
Course Code	17 MEL 76
Course Title	CIM LAB
CO1	Develop fundamental skills to write manual part programming for various CNC Lathe operations
CO2	Develop knowledge to write manual part programming for various turning operations. Operations.Generate CNC Mill Part programming for Point to point motions, Line motions, Circular interpolation, Contour motion, Pocket
CO3	milling- circular, rectangular, Mirror commands etc.
CO4	Evaluate the Use of Canned Cycles for Drilling, Peck drilling, Boring, Tapping, Turning, Facing,Taper turning Thread cutting etc.
CO5	Analyze for the design and analysis of Robotics and FMS
Course Code	(17 MEL76)
Course Title	DESIGN LAB
	student will be able to:
CO1	Apply the essence of kinetics and dynamics through experiments.
CO2	Analyze the stresses developed in an object through photo elasticity implementation and concept of stress concentration in design.
CO3	Apply the flow pressure distribution across and along the Journal bearing.
CO4	Analyze experiments to obtain the mechanical behaviour Strain guges

CO5	Analyze experiments to obtain the mechanical behaviour strain rosetts and gyroscope.
Course Code	17 ME 81
Course Title	OR
	Understand the meaning, definitions, scope, need, phases and techniques of operations research. Formulate as L.P.P and derive optimal solutions to linear programming problems by graphical method, Simplex method, Big-M method and Dual Simplex method
CO1	Formulate as Transportation and Assignment problems and derive optimum solutions for transportation, Assignment and travelling salesman problems. Solve problems on game theory for pure and mixed strategy under competitive environment.
CO2	Solve waiting line problems for M/M/1 and M/M/K queuing models.
CO3	Construct network diagrams and determine critical path, floats for deterministic and PERT networks including crashing of Networks
CO4	Determine minimum processing times for sequencing of n jobs-2 machines, n jobs-3 machines, n jobs-m machines and 2 jobs-n machines using Johnson's algorithm
CO5	17 ME 82
Course Code	AM
CO1	Define Additive manufacturing, understand the different process of Additive Manufacturing and visualize the guidelines provided for AM Process.
CO2	Visualize how a hydraulic/pneumatic and electric actuator will work to accomplish the function.
CO3	Understand the different process of Additive Manufacturing. using Polymer and Powder metallurgy
CO4	Understanding Nano materials and Nano materials manufacturing process. Analyse the different characterization techniques using optical microscopy like SEM, TEM and XRD.
CO5	Describe the various NC, CNC machine programing and Automation techniques
Course Code	17 ME 831
Course Title	PLM
	Understand the meaning, definitions, scope, need, phases and techniques of operations research. Formulate as L.P.P and derive optimal solutions to linear programming problems by graphical

	method, Simplex method, Big-M method and Dual Simplex method
CO1	Formulate as Transportation and Assignment problems and derive optimum solutions for transportation, Assignment and travelling salesman problems. Solve problems on game theory for pure and mixed strategy under competitive environment.
CO2	Solve waiting line problems for M/M/1 and M/M/K queuing models.
CO3	Construct network diagrams and determine critical path, floats for deterministic and PERT networks including crashing of Networks
CO4	Determine minimum processing times for sequencing of n jobs-2 machines, n jobs-3 machines, n jobs-m machines and 2 jobs-n machines using Johnson's algorithm
CO5	17 ME 831
Course Code	17 ME 84
Course Title	INTERNSHIP
	ABLE TO LEARN INDUSTRIAL PRACTICES
CO1	LEARN TO WORK IN TEAMS
CO2	LEARN TO READ ASSEMBLY DRAWINGS AND WORK ON DIFFERENT MACHINES
CO3	KNOW THE SAFETY MEASURES IN INDUSTRIES
CO4	KNOW INDUSTRIAL ACTS AND AWARENESS ABOUT POLLUTION
CO5	17 ME 84
Course Code	17 ME 85
Course Title	PROJECT
CO1	Identify and interpret the realistic mechanical engineering problems and related systems.
CO2	Apply the basic principles and concepts of mechanical engineering in real world systems based on professional ethics and responsibilities
CO3	Criticize and experiment to achieve optimum solutions for mechanical engineering problems.
CO4	Analyse, evaluate and review the obtained solution for problems in mechanical engineering

	systems.
CO5	Able to use the tools and learn fabrication, design and work in teams
Course Code	17 MES 86
Course Title	SEMINAR
	Demonstrate the ability to engage in self learning
CO1	Review scientific literature and interpret the results presented
CO2	Organize and present technical content in a structured manner
CO3	Utilize modern tools (audio/visual aids) for effective presentation of scientific content
CO4	Demonstrate the principles of professional ethics

III SEMESTER

Course Code	ENGINEERING MATHEMATICS (18MAT31)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	1	2	2	2	1	1	2	2	3	1	2	0
CO2	3	3	3	2	2	2	2	1	1	2	2	3	2	2	0
CO3	3	3	3	1	1	1	1	1	1	1	1	3	2	3	0
CO4	3	3	3	2	2	2	2	1	2	2	2	3	3	2	0
CO5	3	3	3	2	2	2	2	1	2	2	2	3	3	2	0
AVG	3	3	3	1.6	1.8	1.8	1.8	1	1.4	1.8	1.8	3	2.2	2.2	0

Course Code	MSM(18ME32)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	0	0	1	1	0	0	1	0	1	1	1	0
CO2	3	2	2	0	0	1	1	0	0	0	0	1	1	1	0
CO3	3	2	0	0	0	0	0	0	0	0	1	1	1	1	0
CO4	3	2	2	0	0	2	0	0	0	0	0	1	1	1	0
CO5	3	2	2	0	0	1	0	0	0	0	0	1	1	1	0
AVG	3	2.2	2	0	0	1.3	1	0	0	1	1	1	1	1	0

Course Code	BTD(18ME33)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2			1	1			1		1	1	1	
CO2	3	2	2			1	1					1	1	1	
CO3	3	2									1	1	1	1	
CO4	3	2	2			2						1	1	1	
CO5	3	2	2			1						1	1	1	
AVG	3.0	2.4	2.0	0.0	0.0	1.1	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0

Course Code	MOM(18ME34)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	0	0	1	1	1	0	0	0	1	3	0	0
CO2	3	3	1	0	0	1	1	1	0	0	0	1	3	0	0
CO3	3	3	1	0	0	1	1	1	0	0	0	1	3	0	0
CO4	3	3	2	0	0	1	1	1	0	0	0	1	3	0	0
CO5	3	3	2	0	0	1	1	1	0	0	0	1	3	0	0
AVG	3	3	1.6	0	0	1	1	1	0	0	0	1	3	0	0

Course Code	MCW(18ME35)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	0	1	2	1	1	0	0	1	0	1	3	2	2
CO2	3	0	0	0	2	1	1	0	0	1	0	1	3	1	2
CO3	3	0	0	0	2	1	0	0	0	1	0	1	3	1	2
CO4	3	0	0	1	2	1	1	0	0	1	0	1	3	2	2
CO5	3	0	0	1	2	1	1	0	0	1	0	1	3	2	2
AVG	3	0	0	1	2	1	1	0	0	1	0	1	3	1.6	2

Course Code	CAMD(18ME36)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
AVG	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0

Course Code	Materials Testing Laboratory(18MEL37)

IV SEMESTER

Course Code	ENGINEERING MATHEMATICS(18MAT41)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3										2	3	2	
CO2	3	3	2	1								2	3	3	
CO3	2	3	3	2								2	3	3	
CO4	2	3	3	2								2	3	3	
CO5		3	3	3								2	3	3	
AVG	2.5	3	2.8	2	0	0	0	0	0	0	0	2	3	2.8	0

Course Code	KOM(18ME43)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	0	0	0	1	2	1	0	1	0	2	1	0	2
CO2	3	3	2	0	0	0	2	1	0	1	0	1	1	0	2
CO3	2	2	0	0	0	2	0	1	0	1	0	2	1	0	2
CO4	2	1	0	0	0	2	0	1	0	1	0	1	1	0	2
CO5	2	1	0	0	0	0	0	1	0	1	0	1	1	0	2
AVG	2	1.6	2	0	0	1.7	2	1	0	1	0	1.4	1	0	2

Course Code	ATD(18ME42)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2					2		1			1		
CO2	3	2	2					2		1			1		
CO3	3	2	2					2		1			1		
CO4	3	2	2					2		1			1		
CO5	3	2	2					2		1			1		
AVG	3	2	2	0	0	0	0	2	0	1	0	0	1	0	0

Course Code	FM(18ME44)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3										2	2		
CO2	3	3										2	2		
CO3	3	3	2									2	2		
CO4	3	3	2									2	2		
CO5	3	2	1		1							2	2		
AVG	3	2.8	1.7	0	1	0	0	0	0	0	0	2	2	0	0

Course Code	MCF(18ME45)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	0	0	0	1	1	0	0	1	0	1	3	2	1
CO2	3	3	0	0	0	1	1	0	0	1	0	1	3	3	1
CO3	3	2	0	0	0	1	1	0	0	1	0	1	3	3	1
CO4	3	2	2	0	0	1	1	0	0	1	0	1	3	3	1
CO5	3	2	2	0	0	1	1	0	0	1	0	1	3	3	1
AVG	3	2.3	2	0	0	1	1	0	0	1	0	1	3	2.8	1

Course Code	MMM(18ME46)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	0	0	0	1	2	1	0	1	0	2	1	0	2
CO2	3	3	2	0	0	0	2	1	0	1	0	1	1	0	2
CO3	3	2	0	0	0	2	0	1	0	1	0	2	1	0	2
CO4	3	1	0	0	0	2	0	1	0	1	0	1	1	0	2
CO5	3	1	0	0	0	0	0	1	0	1	0	1	1	0	2
AVG	3	1.6	2	0	0	1.7	2	1	0	1	0	1.4	1	0	2

Course Code	MMM LAB(18MEL47)

Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
AVG	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
Course Code	FF LAB(18MEL38)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
AVG	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0

Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
AVG	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
Course Code	MC SHOP(18MEL48)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
AVG	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0

V SEMESTER

Course Code	M&E(18ME51)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	0	0	1	1	0	0	1	0	1	1	1	0
CO2	3	2	2	0	0	1	1	0	0	0	0	1	1	1	0
CO3	3	2	0	0	0	0	0	0	0	0	1	1	1	1	0
CO4	3	2	2	0	0	2	0	0	0	0	0	1	1	1	0
CO5	3	2	2	0	0	1	0	0	0	0	0	1	1	1	0
AVG	3.0	2.3	2.0	0.0	0.0	1.3	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Course Code	DOM(18ME54)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	0	3	1	0	1	0	0	0	1	3	3	2
CO2	3	3	1	0	3	1	0	1	0	0	0	1	1	2	2
CO3	3	3	1	0	2	1	0	1	0	0	0	1	3	3	3
CO4	3	3	2	0	0	1	0	1	0	0	0	1	2	3	2
CO5	3	3	2	0	0	1	0	1	0	0	0	1	3	3	3
AVG	3.0	3.0	1.3	0.0	2.7	1.0	0.0	1.0	0.0	0.0	0.0	1.0	2.3	2.8	2.3
Course Code	TM(18ME53)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1		0	0					1			
CO2	3	2	2	1		0	0					1			
CO3	3	2	2	2		1	1					1			
CO4	3	2	2	2		1	1					1			
CO5	3	2	2	2		1	1					1			
AVG	3.0	2.0	2.0	1.5	0.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Course Code	DME1(18ME52)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	3			2	3	3	0		3	2	3	2	
CO2	3	3	3	2		2	1	3	2		3	2	3	2	
CO3	3	3	3	2		2	1	3	2		3	2	3	2	
CO4	3	3	3	2		2	1	3	2		3	2	3	2	
CO5	3	3	3	2		2	1	3	2		3	2	3	2	
AVG	2.5	2.5	3.0	2.0	0.0	2.0	1.5	3.0	2.0	0.0	3.0	2.0	3.0	2.0	0.0
Course Code	FPE(18ME55)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3								1		2	2	1	1
CO2	3	3	2		2					1		2	2	1	
CO3	3	3	2		2					1		2	2	1	

VI SEMESTER

Course Code	FEM(18ME61)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	0	0	0	0	0	1	0	0	0	1	2	1	1
CO2	3	2	1	1	0	0	0	1	0	0	0	1	2	1	2
CO3	3	2	1	1	0	0	0	1	0	0	0	1	2	2	2
CO4	3	2	1	1	1	0	0	1	0	0	0	1	2	1	2
CO5	3	2	1	0	1	0	0	1	0	0	0	1	2	1	2
AVG	3	2	1	1	1	0	0	1	0	0	0	1	2	1.2	1.8
Course Code	ED(18ME646)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3											1		
CO2	3	3	3			3	3						1		
CO3		3	3			3	3						1		
CO4	3	3	3			3	3						1		
CO5	3	3	3			3	3						1		
AVG	3.0	3.0	3.0	0.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Course Code	HT(18ME63)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
AVG	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
Course Code	DME2(18ME62)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2		2	3	3	3	2	3	3	3	2	
CO2	3	3	3	2		2	1	3	3	2	3	3	3	2	
CO3	3	3	3	2		2	1	3	3	2	3	3	3	2	
CO4	3	3	3	2		2	1	3	3	3	3	3	3	2	
CO5	3	3	3	2		2	1	3	3	3	3	3	3	2	
AVG	3	3	3	2	0	2	1.4	3	3	2.4	3	3	3	2	0
Course Code	DSA (18CS652)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3												3		
CO2		3											3		
CO3			3										3		

CO4	3		2		2					1		2	2	1	
CO5	3		2		2					1		2	2	1	1
AVG	3.0	3.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	1.0	0.0	2.0	2.0	1.0	1.0
Course Code	OM(18ME56)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	2			2	1	2	2	2		1			
CO2	3	3	2			1	1	2		2	2	1		3	
CO3	1	2	3	3		1	1				3			3	
CO4		2	2	3	3			2			2	2		2	
CO5		1			3			1		2	2	3		1	
AVG	1.7	2.0	2.3	3.0	3.0	1.3	1.0	2.0	2.0	2.0	2.3	1.3	0.0	2.7	0.0
Course Code															
Course Title															
CO1															
CO2															
CO3															
CO4															
CO5															
AVG															
Course Code															
Course Title															
CO1															
CO2															
CO3															
CO4															
CO5															
AVG															
Course Code															
Course Title															
CO1															
CO2															
CO3															
CO4															
CO5															
AVG															

Course Code	FM LAB(18MEL57)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
AVG	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0

Course Code	ECLAB(18MEL58)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
AVG	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0

VII SEMESTER

CO4			3										3		
CO5			3										3		
AVG	3.0	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Course Code	JAVA(18ME653)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3								2	3		
CO2	3	3	3	3								2	2		
CO3	3	3	3	3								2	2		
CO4	3	2	2	2								2	2		
CO5	3	3	3	3								2	3		
AVG	3.0	2.8	2.8	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.3	0.0	0.0
Course Code	T&I(18EI651)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1									1	3		
CO2	3	2	2												
CO3	3	1	1									1			
CO4	3	3	1	1											
CO5	3	3	1	1											
AVG	3.0	2.0	1.3	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.0	0.0	0.0
Course Code	HTLAB (18MEL67)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	0	0	0	0	0	0	0	0	0	0	2	2	0
CO2	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0
CO3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0
CO4	3	1	0	0	0	0	0	0	0	0	0	1	0	0	0
CO5	3	1	0	0	1	0	0	0	0	0	0	1	0	0	0
AVG	3	1	0	0	1	0	0	0	0	0	0	0	2	2	0
Course Code	CAMA(18MEL68)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3			1				1		1		1	1		
CO2	3			3	1	1		1		3			2		
CO3	3			1	1	1		1		1		1	2		
CO4	3			2						2		1	2		
CO5	3			2						2		1	2		
AVG	3	0	0	1.8	1	1	0	1	0	1.8	0	1	1.8	0	0

Course Code	TOE(18ME643)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	0	0	0	0	0	0	1	1	0	1	1	1	0
CO2	3	2	0	0	0	0	0	0	1	1	0	1	1	1	0
CO3	3	2	2	1	0	0	0	0	1	0	0	1	1	1	0
CO4	3	2	2	1	0	0	0	1	1	0	0	1	1	1	1
CO5	3	2	2	1	0	0	0	1	1	0	0	1	1	1	1
AVG	3.0	2.0	2.0	1.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0
Course Code	RAC(18ME642)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3											1		
CO2	3	3	3			3	3						1		
CO3		3	3			3	3						1		
CO4	3	3	3			3	3						1		
CO5	3	3	3			3	3						1		
AVG	3.0	3.0	3.0	0.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Course Code	V&NE(18ME644)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3

Course Code	CE(18ME71)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	0	0	0	0	0	1	0	0	0	2	2	2	3
CO2	3	2	1	0	0	0	0	1	0	0	0	2	3	2	3
CO3	3	3	1	0	0	0	0	1	0	0	0	1	3	3	3
CO4	3	2	1	0	0	0	0	1	0	0	0	1	2	2	3
CO5	3	3	1	0	0	0	0	1	0	0	0	2	1	1	2
AVG	2.8	2.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.5	2.5	2.3	3.0
Course Code	COMPUTER AIDED DESIGN AND MANUFACTURING(18ME72)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1				1	2					2	1		2
CO2	3	3	2				2					1	1		2
CO3	2	2				2						2	1		2
CO4	2	1				2						1	1		2
CO5	2	1										1	1		2
AVG	2.0	1.8	2.0	0.0	0.0	1.7	2.0	0.0	0.0	0.0	0.0	1.5	1.0	0.0	2.0
Course Code	TQM(18ME734)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	0	0	0	0	0	1	0	0	0	2	2	2	3
CO2	3	2	1	0	0	0	0	1	0	0	0	2	3	2	3
CO3	3	3	1	0	0	0	0	1	0	0	0	1	3	3	3
CO4	3	2	1	0	0	0	0	1	0	0	0	1	2	2	3
CO5	3	3	1	0	0	0	0	1	0	0	0	2	1	1	2
AVG	2.8	2.2	1	0	0	0	0	1	0	0	0	1.6	2.2	2	2.8
Course Code	OR(18ME735)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	0	0	1	1	0	0	1	0	1	1	1	0
CO2	3	2	2	0	0	1	1	0	0	0	0	1	1	1	0
CO3	3	2	0	0	0	0	0	0	0	0	1	1	1	1	0
CO4	3	2	2	0	0	2	0	0	0	0	0	1	1	1	0
CO5	3	2	2	0	0	1	0	0	0	0	0	1	1	1	0
AVG	3.0	2.2	2.0	0.0	0.0	1.3	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Course Code	EV(18EE)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2			1	2		1		2		3	1		1
CO2	2	2				2			3	3		3	1		1
CO3	2	2				2			2	3		3	1		1
CO4	3	2			1			1	1	3		3	1		1
CO5	3	2			1			1	1	3		3	1		1
AVG	2.4	2	0	0	1	2	0	1	1.8	2.8	0	3	1	0	1
Course Code	PYTHON(18ME746)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	0	0								1	1	0
CO2	2	3	3	0	0								1	1	0
CO3	2	2	3	3	0								1	1	0
CO4		2	3	0	3								1	1	0
CO5		3	3	0	2								1	1	0
AVG	1.2	2.6	3	0.6	1								1	1	0
Course Code	Introduction to AI (18ME754)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2							3						0
CO2	2	2							3						0
CO3	2	2							3						0
CO4	2	2							3						0
CO5	2	2						3	3						0
AVG	2	2						0.6	3						0

CO1	1												1	1	0
CO2	2	1											1	1	0
CO3	2	1		1									2	1	0
CO4	1	1	3	2		2	2		2	2			1	1	1
CO5	1		3	1		2	2		2	2			2	1	1
AVG	1.5	1.0	3.0	1.5	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	1.3	1.0	1.0
	MINI PROJECT(18MEP68)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3			2		1	2		2	2		3	1	1	1
CO2	3	2	2					3	3	3	2	3			
CO3			2						3	2	2	3			
CO4		3	2	2	2				2	3	3	3	3	1	3
CO5												3			
AVG	3.0	2.5	2.0	2.0	2.0	1.0	2.0	3.0	2.5	2.5	2.3	3.0	2.0	1.0	2.0
Course Code	EE(18ME81)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	0	0	0	1	2	0	0	0	0	2	1	0	2
CO2	3	3	2	0	0	0	2	0	0	0	0	1	1	0	2
CO3	2	2	0	0	0	2	0	0	0	0	0	2	1	0	2
CO4	2	1	0	0	0	2	0	0	0	0	0	1	1	0	2
CO5	2	1	0	0	0	0	0	0	0	0	0	1	1	0	2
AVG	2	1.6	2	0	0	1.6	2	0	0	0	0	1.4	1	0	2
Course Code	AE(18ME82)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
AVG	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
Course Code															
Course Title															
CO1															
CO2															
CO3															
CO4															
CO5															
AVG															
Course Code	INTERNSHIP(18ME84)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	0	0	1	0	0	0	2	1	1	2	0	0	0
CO2	1	1	0	0	1	0	2	0	2	1	0	2	0	0	0
CO3	1	1	0	0	1	0	0	1	3	3	2	2	0	0	0
CO4	0	0	0	0	2	0	0	0	3	2	1	2	0	0	0
CO5	0	0	0	0	2	0	0	0	3	2	1	2	0	0	0
AVG	1	1	0	0	1.4	0	2	1	2.6	1.8	1.3	2	0	0	0
Course Code	PROJECT/PHASE2 (18ME85)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	0	2	0	1	2	0	2	2	0	3	1	1	1
CO2	3	2	2	0	0	0	0	3	3	3	2	3	0	0	0
CO3	0	0	2	0	0	0	0	0	3	2	2	3	0	0	0
CO4	0	3	2	2	2	0	0	0	2	3	3	3	3	1	3
CO5	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
AVG	3	2.5	2	2	2	1	2	3	2.5	2.5	2.3	3	2	1	2
Course Code	SEMINAR(18MES86)														

Course Code	CIM LAB (18MEL76)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	0	3	0	2	2	3	0	0	0	0	3	3	2
CO2	3	3	0	3	0	2	0	0	0	0	0	0	3	3	2
CO3	3	3	0	3	3	3	3	3	0	2	0	3	3	3	3
CO4	3	2	0	2	2	2	3	2	0	2	0	3	2	2	3
CO5	3	2	0	2	2	2	3	2	0	2	0	3	2	2	3
AVG	3	2.6	0	2.6	2.3	2.2	2.8	2.5	0	2	0	3	2.6	2.6	2.6
Course Code	DESIGN LAB (18MEL77)														
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	0	1	0	0	0	0	0	0	3	2	2
CO2	3	2	3	1	0	1	0	0	0	0	0	0	3	2	2
CO3	2	2	3	3	0	1	0	0	0	0	0	0	3	2	2
CO4	2	2	3	1	0	1	0	0	0	0	0	0	3	3	3
CO5	2	2	3	1	0	1	0	0	0	0	0	0	3	3	3
	2.4	2.2	3	1.8	0	1	0	0	0	0	0	0	3	2.4	2.4
Course Code															
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
AVG															
Course Code															
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
AVG															

Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	0	3	0	0	0	0	0	0	0	3	3	3	0
CO2	3	3	0	3	0	0	0	0	0	0	0	3	3	0	0
CO3	3	3	0	0	0	0	0	0	0	3	0	3	3	0	0
CO4	3	3	0	3	3	0	0	0	3	3	0	3	3	0	0
CO5	0	0	0	0	0	0	0	3	0	0	0	3	0	3	0
AVG	3	3	0	3	3	0	0	3	3	3	0	3	3	3	0
Course Code															
Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1															
CO2															
CO3															
CO4															
CO5															
AVG															

Course Code	
Course Title	18 MAT 31
	TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES
CO1	
CO2	Know the use of periodic signals and fourier series to analyse circuits and system communications.
CO3	Explain the general linear system theory for continous-time signals and digital signal processing using the Fourier Transform
CO4	Employ appropriate numerical methods to solve algebraic and transcendental equations
CO5	Apply Green's theorem, Divergence theorem and Stoke's theorem in variouys applications in the field of electro- magnetic and gravtitaional fields and fluid flow problems.
Course Code	18 ME 32
Course Title	MOM
	This course will enable students to;
CO1	Understand simple, compound, thermal stresses and strains their relations, Poisson's ratio, Hooke's law, mechanical properties including elastic constants and their relations and to determine stresses, strains and deformations in bars with varying circular and rectangular cross sections subjected to normal and temperature loads.
CO2	Determine plane stress, principal stress, maximum shear stress and their orientations using analytical method and Mohr's circle and also stress distribution in thick and thin cylinders.
CO3	Draw SFD and BMD for different beams including cantilever beams, simply supported beams and overhanging beams subjected to UDL, UVL, Point loads and couples and to determine dimensions, bending stress, shear stress and its distribution in beams of circular, rectangular, symmetrical I and T sections subjected to point loads and UDL.
CO4	Determine the dimensions of shafts based on tensional strength, rigidity and flexibility and also elastic stability of columns using Rankin's and Euler's theory.
CO5	Explain the theories of failure and to determine the strain energy due to normal

	stress, shear stress, bending and torsion.
Course Code	18 ME 33
Course Title	BTD
	This course will enable students to;
CO1	Understand and apply the concepts of TD temperature scales work, and heat interactions for different types of systems by solving problems with relevant units.
CO2	Illustrate the different forms of work to flow & non flow process by applying 1st Law & 2nd law of Thermodynamics
CO3	Calculations of entropy by applying TdS relations, for a reversible and irreversible processes derived from second law of thermodynamics
CO4	Problem solving procedures related to pure substances using PT, PV, TH diagrams and its applications, discussing the available and un available energy by different laws/relations
CO5	Discussing the Thermodynamics Properties and solving problems on Ideal gas and its mixtures. Also real gases at all ranges of pressure, temperatures using Vander Waals equation, Redlich Wong equation and Beattie
Course Code	18ME34
Course Title	MSM
	This course will enable students to;
CO1	Describe the mechanical properties of metals, their alloys and various modes of failure.
CO2	Understand the microstructures of ferrous and non-ferrous materials to mechanical properties.
CO3	further to use the available of results to draw shear force and bending moment diagrams.
CO4	Explain the processes of heat treatment of various alloys.
CO5	Understand the properties and potentialities of various materials available and material selection procedures.
Course Code	18 ME 35

Course Title	MCW
	This course will enable students to;
CO1	To impart knowledge to the students on the basic concepts of Manufacturing and sand Casting process
CO2	To enrich knowledge about special casting processes and principle of various melting furnaces.
CO3	To illustrate the solidification process and casting of non – ferrous metals.
CO4	To introduce the students the concepts of Conventional and special welding processes and their field of applications.
CO5	To acquire the knowledge on quality test methods conducted for casting and welded components.
Course Code	18 ME 36
Course Title	CAMD
	This course will enable students to;
CO1	Understand and draw the section of solids and conversion of isometric views of machine parts in to orthographic views
CO2	Able to understand and draw the sectional views of threads of ISO Metric,BSW,Square and Acme threads in 2D
CO3	Understand and draw the types of Keys as per the ISO standards in 2D Understand and draw single and double riveted joints
CO4	Able to understand and draw cotter and knuckle joint for two rods in 2D and split muff, protected type flanged, pin type flexible, Oldham's and universal couplings in 2D
CO5	Analyse, understand and draw assemblies from the part drawings with limits ,fits and tolerance given for Plummer block, Ram bottom safety valve, I.C. Engine connecting rod, Screw Jack, Tailstock of lathe, Machine Vice and Lathe square tool post in 2D and 3D
Course Code	18 MEL 37
Course Title	MATERIALS TESTING LABORATORY
	This course will enable students to;

CO1	Understand specimen preparation for metallographic examination, microstructures and heat treatment processes.
CO2	Understand wear characteristics of ferrous , non ferrous and composite material and learn about non destructive testing experiments.
CO3	Operate Universal Testing Machine for tensile, shear and compression tests of metallic and non metallic specimens and evaluate their properties.
CO4	Operate Universal Testing Machine for bending tests of metallic and non metallic specimens and evaluate their mechanical properties.
CO5	Evaluate hardness of M.S, C.I Specimen by conducting Izod , Charpy, Brinell, Rockwell and Vicker's hardness tests.
Course Code	18 MEL 38
Course Title	FF LAB
	This course will enable students to;
CO1	Analyze and optimize foundry sand, core sand to a particular application.
CO2	Build moulds with or without patterns.
CO3	Understand casting of ferrous and non ferrous objects.
CO4	Develop skills in making forging models manually
CO5	Develop skills in making forging models with the help of power hammers
Course Code	18 MAT 41
Course Title	COMPLEX ANALYSIS, PROBABILITY AND STATISTICAL METHODS
CO1	Apply complex numbers to determine continuity/ differentiability/ analiticity of a function.
CO2	Identify the transformation and evaluate a contour intergral using Cauchy's integral formula.
CO3	Classify the random variables to determine the appropriate probability distributions
CO4	Use correlation and regression analysis to fit a suitable mathematical model for

	the statistical data
CO5	Detremine the joint probability distribution,its mean, variance and covariance.
Course Code	18 ME 42
Course Title	ATD
	This course will enable students to;
CO1	Apply thermodynamic concepts to analyze the performance of gas power cycles and jet propulsion and evaluate performance of Brayton cycle
CO2	Apply thermodynamic concepts to analyze the performance of vapour power cycles.
CO3	Apply thermodynamic concepts to analyze the performance of IC Engines and combustion engg
CO4	Explore the principles, applications and COP of refrigeration systems and Air conditioners
CO5	Apply Thermodynamic concepts to determine performance parameters of Air compressors and Steam nozzles
Course Code	18 ME 43
Course Title	KOM
	This course will enable students to;
CO1	Identify mechanisms with basic understanding of motion.
CO2	Comprehend motion analysis and Carry out motion analysis of planar mechanisms by graphical method.
CO3	Comprehend motion analysis and Carry out motion analysis of planar mechanisms by analytical method
CO4	Comprehend motion analysis and Carry out motion analysis of gears and gear trains.
CO5	Comprehend motion analysis and Carry out motion analysis of cams
Course Code	18 ME 44
Course Title	FM

	This course will enable students to;
CO1	Understand the properties of fluids, fluid behaviour and flotation of bodies
CO2	Comprehend various types of fluid flow, transformation of fluid energy to mechanical energy and measurement of fluid flow
CO3	Understand the basic concept of Laminar flow, turbulent flow and Energy consideration in pipe flow
CO4	Understand the concept of boundary layer, concept of lift and drag in fluid flow and apply dimensional analysis to form dimensionless numbers in terms of input output variables.
CO5	Understand the basic concept of compressible flow and CFD
Course Code	18 ME 45
Course Title	MCF
CO1	To understand the construction and specification of different machine tools
CO2	To gain knowledge pertaining to relative motion and mechanics required for various machine tools
CO3	To develop knowledge of cutting tool materials and geometry of cutting tools
CO4	To apply mechanics of machining process and effect of various parameters on economics of machining
CO5	To analyze the wear and tear of cutting tools and economics of machining process
Course Code	18 ME 46
Course Title	MMM
CO1	Understand the objectives of metrology, methods of measurement, selection of measuring instruments, standards of measurement and calibration of end bars. Describe slip gauges, wringing of slip gauges and building of slip gauges, angle measurement using sine bar, sine center, angle gauges, optical instruments and straightness measurement using Autocollimator.
CO2	Explain tolerance, limits of size, fits, geometric and position tolerances, gauges

	and their design.
CO3	Understand the principle of Johnson Mikrokator, sigma comparator, dial indicator, LVDT, back pressure gauges, Solex comparators and Zeiss Ultra Optimeter
CO4	Explain measurement systems, transducers, intermediate modifying devices and terminating devices.
CO5	Describe functioning of force, torque, pressure, strain and temperature measuring devices.
Course Code	18 MEL 47
Course Title	MMM LAB
	This course will enable students to;
CO1	Calibrate different instruments
CO2	Apply the concept of measuring thread profile of different components in mechanical engineering industry.
CO3	Evaluate Angular measurement of Various entities.
CO4	Evaluate force of components using measuring devices.
CO5	Evaluate surface irregularities of components using measuring devices.
Course Code	18 MEL 48
Course Title	M/CSHOP
	This course will enable students to;
CO1	Operate lathe machine tool for various turning operations in a given cylindrical specimen.
CO2	Operate shaping machine for various machining operations in a given cubical specimen.
CO3	Operate shaping machine for various machining operations in a given cubical specimen.
CO4	Operate shaping machine for various machining operations in a given cubical specimen.
CO5	Operate milling machine for producing a spur gear in a given blank diameter or

	the number of teeth through simple indexing procedures.
Course Code	18 ME 51
Course Title	M&E
CO1	Understand needs, scope functions and roles ,scope and evolution of management
CO2	understand importance and purpose of planning, hierarchy of planning, and analyze its types, decision making, organizing, staffing, directing and controlling
CO3	Select the best economic model from the available best alternatives
CO4	Understand various interest rates and impelent the suitable one
CO5	Estimate various depreciation values of commodities
Course Code	18 ME 52
Course Title	DME1
CO1	Describe the design process, choose materials and Apply the codes and standards in design process.
CO2	Analyze the behavior of machine components under static, impact, fatigue loading using failure theories
CO3	Design shafts, joints, couplings.
CO4	Design of riveted and welded joints.
CO5	Design of threaded fasteners and power screws
Course Code	18ME53
Course Title	DOM
	This course will enable students to;
CO1	Determine the forces and couples for static and dynamic conditions of four bars and slider crank mechanisms to keep the system in equilibrium.
CO2	Determine magnitude and angular position of balancing masses under static and dynamic condition of rotating masses in same and different planes and

	determine unbalanced primary, secondary forces and couples in single and multi-cylinder engine.
CO3	Determine sensitiveness, isochronisms, effort and power of porter and Hartnell governors. Determine gyroscopic couple and effects related to 2, 4 wheeler, plane disc, ship and aeroplanes.
CO4	Understand types of vibration, SHM and methods of finding natural frequencies of simple mechanical systems.
CO5	Determine equation of motion, natural frequency, damping factor, logarithmic decrement of damped free-vibration (SDOF) systems. Determine equation of motion of rotating and reciprocating unbalance systems, magnification factor, andtransmissibilityof forced vibration (SDOF) systems.
Course Code	18 ME 54
Course Title	TM
CO1	Apply model studies and thermodynamic concepts in solving turbo machines problems
CO2	Learn about methods of energy storage Evaluate turbo machines using concepts of turbine equations and velocity triangles., energy management.
CO3	Analyse and evaluate performance of impulse and reaction steam turbines
CO4	Analyse and evaluate performance of hydraulic turbines
CO5	Analyse and evaluate performance of power absorbing turbo machines
Course Code	18 ME 55
Course Title	FPE
CO1	To provide an insight into the capabilities of hydraulic and pneumatic fluid power.
CO2	To understand concepts and relationships surrounding force, pressure, energy and power in fluid power systems
CO3	To examine concepts centering on sources of hydraulic power, rotary and linear actuators, distribution systems, hydraulic flow in pipes, andcontrol components in fluid power systems
CO4	Exposure to build and interpret hydraulic and pneumatic circuits related to

	industrial applications
CO5	To familiarize with logic controls and trouble shooting
Course Code	18 ME 56
Course Title	OM
CO1	To provide an introduction to Operations Management and exposure to forecasting methods, namely qualitative & quatitative methods .
CO2	Impart knowledge on the Aggregate Planning and Materials Requirement Planning?
CO3	Understand the principles/methods of Scheduling and Sequencing.
CO4	Understand the Maintenance Planning and Control and the methods forreliability improvement?
CO5	Impart knowledge on the Modern concepts/ techniques in operations management and Supply Chain management.
Course Code	18 MEL57
Course Title	FM LAB
CO1	To calibrate different flow measuring devices.
CO2	To estimate head losses in pipes and force developed by impact of jet on vanes.
CO3	To conduct performance tests on power generating turbo machines-Impulse turbine.
CO4	To carry out performance tests on power absorbing turbo machines and positive displacement machine.
CO5	To conduct performance tests on power generating turbo machines-Reaction turbine
Course Code	18 MEL58
Course Title	EC LAB
CO1	Conduct appropriate laboratory experiments and interpret the results

CO2	Analyze and Perform experiments to determine the properties of fuels and various grades oils.
CO3	Analyze and Conduct experiments on engines to draw characteristics curves. Test basic performance parameters of I.C. Engine and implement the knowledge in industry
CO4	Determine the energy flow pattern through the I C Engine and identify exhaust emission, factors affecting them and report the remedies.
CO5	Exhibit his competency towards preventive maintenance of stroke2 IC engines.
Course Code	18 ME 61
Course Title	FEM
	This course will enable students to;
CO1	Understand the concepts of plane stresses and plane strains and basic procedure of FEM. Write an interpolation polynomial for linear, quadratic and cubic elements
CO2	Derive the shape functions and to determine the displacements, reactions and stresses in bars and Trusses by using penalty and elimination approach. Also to analyse the higher order Elements
CO3	Determine the deflection of cantilever, Simply Supported and Fixed Beam. Also to determine the angle of twist in Shafts
CO4	Analyse the temperature distribution applying the boundary conditions like conduction and convection. Also to analyse the flow through pipes of uniform and stepped sections
CO5	Analyse the axisymmetric bodies with triangular elements. Also to Analyse the point mass and limped mass matrix for bar and Truss elements
Course Code	18 ME 62
Course Title	DME2
CO1	Design machine members with different cross sections of curved beams like C, I, H etc., Cylinders and cylinder heads and Mechanical systems involving springs, belts and pulleys
CO2	Design different types of gears (spur, bevel, helical and worm) and simple gear

	boxes for different applications
CO3	Design brakes and clutches and hydrodynamic bearings for different applications and Select Anti friction bearings for different applications using the manufacturers, catalogue.
CO4	Apply engineering design tools to product design with proficiency to generate production drawings using CAD software.
CO5	Become good design engineers through learning the art of working in a team with morality and ethics.
Course Code	18 ME 63
Course Title	HT
CO1	Understand the basic modes of heat transfer to Compute temperature distribution in steady-state and unsteady-state heat conduction
CO2	Analyse the heat transfer through extended surfaces. And transient heat conduction
CO3	Analyse the heat conduction by numerical method and explain the principle of radiation Heat transfer
CO4	Analyse the forced and free convective heat transfer.
CO5	Design of heat exchangers using LMTD, NTU methods and analyse the boiling and condensation
Course Code	18 ME 646
Course Title	ED
	This course will enable students to;
CO1	understand the concept of Entrepreneur and Entrepreneurship and relevant roles
CO2	learn creativity and entrepreneurial plan including Project Feasibility and Project Appraisal
CO3	understand Corporate entrepreneurship and issues related to Corporate entrepreneurship

CO4	understand Family and Non Family Entrepreneur & Women entrepreneurs and women entrepreneurs in India
CO5	understand International Entrepreneurship Opportunities and Case studies on Indian Start ups
Course Code	18 CS 652
Course Title	DSA
	This course will enable students to;
CO1	Use different types of data structures, operations and algorithms
CO2	Apply searching and sorting operations on files
CO3	Use stack, Queue, Lists in problem solving
CO4	Use stack,Trees and Graphs in problem solving
CO5	Implement all data structures in a high-level language for problem solving.
Course Code	18 CS 653
Course Title	Java Programming
	This course will enable students to;
CO1	Interpret the need for advanced Java concepts like enumerations and collections in developing modular and efficient programs
CO2	Build client-server applications and TCP/IP socket programs
CO3	Describe the working of string methods
CO4	Illustrate database access and details for managing information using the JDBC API
CO5	Describe how servlets fit into Java-based web application architecture
Course Code	18 EI 651
Course Title	T&I
	This course will enable students to;

CO1	Analyze static and dynamic characteristics of a measurement system.
CO2	Explain the working principles of resistive, inductive transducers.
CO3	Explain the working principles of capacitive and piezoelectric transducers.
CO4	Explain the working principles of transducers used for temperature measurement.
CO5	Select/choose special transducers for measurement of various physical parameters.
Course Code	18 ME643
Course Title	TOE
	This course will enable students to;
CO1	Understand various types of stresses induced in machine elements under different types of loads.
CO2	Comprehend various types of strains induced in machine elements under different types of loads.
CO3	Analyze the structural members: beams, rotating disks.
CO4	Analyze the torsional rigidity of circular and non-circular sections.
CO5	Analyze the stability of columns and elastic members subjected to thermal loads.
Course Code	18ME642
Course Title	RAC
	This course will enable students to;
CO1	Analyze the reversed Carnot cycle and vapour compression refrigeration cycle (VCR).
CO2	Select the air-refrigeration systems for aircraft, and vapour absorption refrigeration system for rural and remote areas and select environmental friendly refrigerants considering the international standards.
CO3	Identify the Psychrometric processes for different applications and design the parameters of air-conditioning system as per standards.

CO4	Understand the human comfort, ASHRAE chart and concept of effective temperature.
CO5	Estimate cooling load and heating load considering human comfort and optimize the air conditioning system as per requirements.
Course Code	18ME644
Course Title	V&NE
CO1	Develop the mathematical models for vibrating systems.
CO2	Solve problems in vibrating systems with single degree of freedom.
CO3	Explain two degree of freedom vibrating systems and solve simple problems.
CO4	Make use of proper instruments for vibrationmeasurement.
CO5	Explain about engineering noise and control.
Course Code	18MEL67
Course Title	HTLAB
CO1	Perform experiments to determine the thermal conductivity of a metal rod
CO2	Conduct experiments to determine convective heat transfer coefficient for free and forced convection and correlate with theoretical values.
CO3	Estimate the effective thermal resistance in composite slabs and efficiency in pin-fin, and surface emissivity of a test plate
CO4	Estimate performance of a refrigerator and effectiveness of fin
CO5	Calculate temperature distribution of study and transient heat conduction through plane wall, cylinder and fin using numerical approach.
Course Code	18MEL68
Course Title	CAMA LAB
CO1	Develop fundamental skills to write manual part programming for various CNC

	Lathe operations
CO2	Develop knowledge to write manual part programming for various turning operations. Operations.Generate CNC Mill Part programming for Point to point motions, Line motions, Circular interpolation, Contour motion, Pocket milling- circular, rectangular, Mirror commands etc.
CO3	Evaluate the Use of Canned Cycles for Drilling, Peck drilling, Boring, Tapping, Turning, Facing,Taper turning Thread cutting etc.
CO4	Analyze for the design and analysis of Robotics and FMS
CO5	Analyze hydraulics software for the design and analysis of hydraulic circuits
Course Code	18MEP68
Course Title	MINI PROJECT
CO1	Apply the basic principles and concepts of mechanical engineering in real world systems based on professional ethics and responsibilities
CO2	Apply the basic principles and concepts of mechanical engineering in real world systems based on professional ethics and responsibilities
CO3	Criticize and experiment to achieve optimum solutions for mechanical engineering problems.
CO4	Analyse, evaluate and review the obtained solution for problems in mechanical engineering systems.
CO5	Able to use the tools and learn fabrication, design and work in teams
Course Code	18 ME 71
Course Title	CE
	This course will enable students to;
CO1	Identify the type of control and control actions.
CO2	Develop the mathematical model of the physical systems.
CO3	Estimate the response and error in response of first and second order systems subjected standard input signals

CO4	Represent the complex physical system using block diagram and signal flow graph and obtain transfer function.
CO5	Analyse a linear feedback control system for stability using Hurwitz criterion,Routh's criterion androot Locus technique in complex domain
Course Code	18 ME 72
Course Title	CAD&M
CO1	To impart knowledge of CIM andAutomation and different concepts of automation by developing mathematical models..
CO2	To make students to understand the Computer Applications in Design and Manufacturing [CAD / CAM) leading to Computer integrated systems. Enable them to perform various transformations of entities on display devices
CO3	To expose students to automated flow lines,assembly lines,Line Balancing Techniques,and Flexible Manufacturing Systems.
CO4	To expose students to computer aided process planning, material requirement planning, capacity planning etc.
CO5	To expose the students to CNC Machine Tools,CNC part programming, and industrial robots and • To introduce the students to concepts of Additive Manufacturing, Internet of Things, and Industry 4.0leading to Smart Factory.
Course Code	18 ME 734
Course Title	TQM
CO1	Explain the various approaches of TQM
CO2	Infer the customer perception of quality
CO3	Analyse customer needs and perceptions to design feedback systems
CO4	Apply statistical tools for continuous improvement of systems
CO5	Apply the tools and technique for effective implementation of TQM.
Course Code	18ME735

Course Title	OR
CO1	Understand the meaning, definitions, scope, need, phases and techniques of operations research. Formulate as L.P.P and derive optimal solutions to linear programming problems by graphical method, Simplex method, Big-M method and Dual Simplex method
CO2	Formulate as Transportation and Assignment problems and derive optimum solutions for transportation, Assignment and travelling salesman problems. Solve problems on game theory for pure and mixed strategy under competitive environment.
CO3	Solve waiting line problems for M/M/1 and M/M/K queuing models.
CO4	Construct network diagrams and determine critical path, floats for deterministic and PERT networks including crashing of Networks
CO5	Determine minimum processing times for sequencing of n jobs-2 machines, n jobs-3 machines, n jobs-m machines and 2 jobs-n machines using Johnson's algorithm
Course Code	18EE646
Course Title	Electric Vehicles
	This course will enable students to;
CO1	To Understand the fundamental laws and vehicle mechanics.
CO2	To Understand working of Electric Vehicles and recent trends.
CO3	Ability to analyze different power converter topology used for electric vehicle application
CO4	Ability to develop the electric propulsion unit
CO5	Ability to develop its control for application of electric vehicles.
Course Code	18CS752
Course Title	Python programming
CO1	Examine Python syntax and semantics and be fluent in the use of Python flow

	control and functions
CO2	Demonstrate proficiency in handling Strings and File Systems.
CO3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
CO4	Interpret the concepts of Object-Oriented Programming as used in Python.
CO5	Implement exemplary applications related to Network Programming, Web Services and Databases in Python.
Course Code	18CS753
Course Title	Introduction to AI
CO1	Identify the AI based problems
CO2	Apply techniques to solve the AI problems
CO3	Define learning and explain various learning techniques
CO4	Discuss on expert systems
CO5	Learning, Expert Systems.
Course Code	17 MEL 76
Course Title	CIM LAB
CO1	Develop fundamental skills to write manual part programming for various CNC Lathe operations
CO2	Develop knowledge to write manual part programming for various turning operations. Operations.Generate CNC Mill Part programming for Point to point motions, Line motions, Circular interpolation, Contour motion, Pocket
CO3	milling- circular, rectangular, Mirror commands etc.
CO4	Evaluate the Use of Canned Cycles for Drilling, Peck drilling, Boring, Tapping, Turning, Facing,Taper turning Thread cutting etc.
CO5	Analyze for the design and analysis of Robotics and FMS

Course Code	(17 MEL76)
	DESIGN LAB
	student will be able to:
CO1	Apply the essence of kinetics and dynamics through experiments.
CO2	Analyze the stresses developed in an object through photo elasticity implementation and concept of stress concentration in design.
CO3	Apply the flow pressure distribution across and along the Journal bearing.
CO4	
CO5	Analyze experiments to obtain the mechanical behaviour strain rosetts and gyroscope.
Course Title	18 ME 81
	EE
CO1	Understand the basic concepts of thermal energy systems.
CO2	Identify renewable energy sources and their utilization.
CO3	Analyse the concepts of solar radiation and study the working of solar PV and thermal systems.
CO4	Demonstrate principles of energy conversion from alternate sources including wind, tides.
CO5	Illustrate the concepts and applications of fuel cells, biomass, thermoelectric convertor and MHD generator and study of energy storage for specific applications. Concept of green energy.
	18 ME 824
Course Code	AE
CO1	To identify the different parts of an automobile and its working
CO2	TO understand the working of transmission and braking systems
CO3	To comprehend the working of steering and suspension systems
CO4	To learn various types of fuels and injection systems
CO5	To know the cause of automobile emissions its effects on environment and

	methods to reduce the emissions
	18 ME 84
	INTERNSHIP
	ABLE TO LEARN INDUSTRIAL PRACTICES
	LEARN TO WORK IN TEAMS
	LEARN TO READ ASSEMBLY DRAWINGS AND WORK ON DIFFERENT MACHINES
	KNOW THE SAFETY MEASURES IN INDUSTRIES
	KNOW INDUSTRIAL ACTS AND AWARENESS ABOUT POLLUTION
Course Code	18ME85
Course Title	PROJECT
CO1	Identify and interpret the realistic mechanical engineering problems and related systems.
CO2	Apply the basic principles and concepts of mechanical engineering in real world systems based on professional ethics and responsibilities
CO3	Criticize and experiment to achieve optimum solutions for mechanical engineering problems.
CO4	Analyse, evaluate and review the obtained solution for problems in mechanical engineering systems.
CO5	Able to use the tools and learn fabrication, design and work in teams
Course Code	18 MES 86
Course Title	SEMINAR
	Demonstrate the ability to engage in self learning
CO1	Review scientific literature and interpret the results presented
CO2	Organize and present technical content in a structured manner
CO3	Utilize modern tools (audio/visual aids) for effective presentation of scientific content

CO4	Demonstrate the principles of professional ethics
CO5	Demonstrate the principles of Presentation

COURSE OUTCOME 2015 BATCH AND 2016 BATCH –CBCS SCHEME		
Mechanical Engineering Department		
SUBJECT: 15ME32-MSM		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME232.1	Describe the mechanical properties of metals, their alloys and modes of failure Such as fatigue, Fracture and Creep
2	15ME232.2	Understand the microstructures of ferrous and non-ferrous materials with respect to mechanical properties.
3	15ME232.3	Explain the Different heat treatment process such as annealing, normalizing,hardening,Tempering and surface hardening methods of steels
4	15ME232.4	Understand the properties and potentialities of Ceramics, plastics and smart Materials
5	15ME232.5	Understand the classification, processing and application of composite materials
SUBJECT: 15ME33-BTD		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME233.1	**Understand** and **apply** the concepts of TD temperature scales work, and heat interactions for different types of systems by solving problems with relevant units.
2	15ME233.2	**Illustrate** the different forms of work to flow & non flow process by applying 1st Law & 2^{nd} law of Thermodynamics
3	15ME233.3	**Calculations** of entropy by applying TdS relations, for a reversible and irreversible processes derived from second law of thermodynamics.
4	15ME233.4	**Problem solving** procedures related to pure substances using PT, PV, TH diagrams and its applications, discussing the available and un available energy by different laws/relations
5	15ME233.5	**Discussing the** Thermodynamics Properties and solving problems on Ideal gas and its mixtures. Also real gases at all ranges of pressure, temperatures using Vander Waals equation, Redlich Wong equation.
SUBJECT: 15ME34-MOM		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME234.1	**Analyse** problems of engineering involving design of components subjected to stress and strain.
2	15ME234.2	**Analyse and determine** plane stress, principal stress, Maximum shear stress and their orientation using analytical method and Mohr's circle and also determine the stress distribution in thick and thin cylinders subjected to pressure.
3	15ME234.3	**Construct** SFD and BMD for different Beams subjected to different types of loads and also determine bending stress and its distribution in beams.
4	15ME234.4	**Determine** the dimensions of shaft subjected to torsion and **analyse** the structures involving Columns and Struts subjected to buckling and compressive load.
5	15ME234.5	**Determine** the strain energy subjected to different loading and apply the concept of theories of failure.
SUBJECT: 15ME35A-MCW		

SL NO	SUB CODE	COURSE OUTCOME
1	15ME235.1	**Attain** thorough knowledge of various casting processes and select the appropriate process for manufacturing of the product.
2	15ME235.2	**Acquire** the knowledge of advanced casting processes commonly used in industries and gain information regarding melting of various metals.
3	15ME235.3	**Explain** the solidification process and casting of non – ferrous metals.
4	15ME235.4	**Understand** and summarize the concept of various welding process used in manufacturing.
5	15ME235.5	**Demonstrate** fundamental skills on metallurgical aspects in welding and inspection methods for the quality assurance of components made upon casting and joining process.
SUBJECT: 15ME36A-CAMD		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME236.1	Visualize and draw section of solids like Pyramids, Prism ,Cubes, Tetrahedron ,Cones and Cylinder
2	15ME236.2	Interpret the pictorial views of simple machine parts and convert them in to orthogonal projections
3	15ME236.3	Describing the various thread forms and draw hexagonal and square headed bolt and nut assembly
4	15ME236.4	Outline keys and draw various joints and couplings in 2D
5	15ME236.5	Preparation of part or assembly drawing as per the conventions
SUBJECT: 15MEL37-MT LAB		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME237.1	**Understand** specimen preparation for metallographic examination, microstructures and heat treatment processes.
2	15ME237.2	**Understand** wear characteristics of ferrous , non ferrous and composite material and learn about non destructive testing experiments.
3	15ME237.3	**Operate** Universal Testing Machine for tensile, shear and compression tests of metallic and non metallic specimens and **evaluate** their properties.
4	15ME237.4	**Operate** Universal Testing Machine for bending tests of metallic and non metallic specimens and **evaluate** their mechanical properties.
5	15ME237.5	**Evaluate** hardness of M.S, C.I Specimen by conducting Izod , Charpy, Brinell, Rockwell and Vicker's hardness tests.
SUBJECT: 15MEL38-FF LAB		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME238.1	**Analyze** and optimize foundry sand, core sand to a particular application.
2	15ME238.2	**Build** moulds with or without patterns.
3	15ME238.3	**Understand** casting of ferrous and non ferrous objects.
4	15ME238.4	**Develop** skills in making forging models manually

5	15ME238.5	**Develop** skills in making forging models with the help of power hammers
SUBJECT: 15ME42-KOM		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME242.1	Identify mechanisms with basic understanding of motion.
2	15ME242.2	Comprehend motion analysis and Carry out motion analysis of planar mechanisms by graphical method.
3	15ME242.3	Comprehend motion analysis and Carry out motion analysis of planar mechanisms by analytical method
4	15ME242.4	Comprehend motion analysis and Carry out motion analysis of gears and gear trains.
5	15ME242.5	Comprehend motion analysis and Carry out motion analysis of cams
SUBJECT: 15ME43-ATD		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME243.1	Apply thermodynamic concepts to analyze the performance of gas power cycles and jet propulsion and evaluate performance of Brayton cycle
2	15ME243.2	Apply thermodynamic concepts to analyze the performance of vapour power cycles.
3	15ME243.3	Apply thermodynamic concepts to analyze the performance of IC Engines and combustion engg
4	15ME243.4	Explore the principles, applications and COP of refrigeration systems and Air conditioners
5	15ME243.5	Apply Thermodynamic concepts to determine performance parameters of Air compressors and Steam nozzles
SUBJECT: 15ME44-MSM		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME244.1	Identify and calculate the key fluid properties used in the analysis of fluid behaviour and to Understand and apply the principles of pressure, buoyancy and floatation and the knowledge of fluid statics
2	15ME244.2	Understand concepts of kinematics and dynamics while addressing problems of mechanical engineering.
3	15ME244.3	Understand the concept of boundary layer in fluid flow and study the properties of turbulent flow and energy considerations in pipe flows.
4	15ME244.4	Apply dimensional analysis to form dimensionless numbers in terms of input output variables and to study the concepts of flow over bodies.
5	15ME244.5	Understand the basic concepts of compressible flow and CFD
SUBJECT: 15ME45-MTO		

SL NO	SUB CODE	COURSE OUTCOME
1	15ME245.1	Explain the construction & specification of various machine tools.
2	15ME245.2	Describe various machining processes pertaining to relative motions between tool & work piece.
3	15ME245.3	Discuss different cutting tool materials, tool nomenclature & surface finish.
4	15ME245.4	Apply mechanics of machining process to evaluate machining time.
5	15ME245.5	Analyze tool wear mechanisms and equations to enhance tool life and minimize machining cost.
SUBJECT: 15ME-46B:MMM		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME246.1	**Apply** knowledge of Measurement, Metrology, and Standards in linear and angular measurement.
2	15ME246.2	A**nalyze** the principle of limits, fits and tolerance while designing and manufacturing the components of their requirement and Understand the principle of comparator.
3	15ME246.3	**Understand** the fundamentals of various methods for the measurement of forms and basic concepts of Laser and CMM.
4	15ME246.4	**Understand** the significance of measurement system, errors, transducers, intermediate modifying devices and terminating devices.
5	15ME246.5	**Apply** various devices for measuring torque, force, pressure, strain, stress and temperature.
SUBJECT: 15MEL47B-MMM LAB		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME247.1	**Calibrate** different instruments.
2	15ME247.2	**Apply** the concept of measuring thread profile of different components in mechanical engineering industry.
3	15ME247.3	**Evaluate** Angular measurement of Various entities.
4	15ME247.4	**Evaluate** force of components using measuring devices.
5	15ME247.5	**Evaluate** surface irregularities of components using measuring devices.
SUBJECT: 15MEL48B-M/C SHOP		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME248.1	Operate lathe machine tool for various turning operations in a given cylindrical specimen.
2	15ME248.2	Operate shaping machine for various machining operations in a given cubical specimen.
3	15ME248.3	Operate shaping machine for various machining operations in a given cubical specimen.
4	15ME248.4	Operate shaping machine for various machining operations in a given cubical specimen.
5	15ME248.5	Operate milling machine for producing a spur gear in a given blank diameter or the number of teeth through simple indexing procedures.
SUBJECT: 15ME51-M&E		
SL	SUB CODE	COURSE OUTCOME

NO		
1	15ME351.1	Understand needs, functions, roles, scope and evolution of Management
2	15ME351.2	Understand importance, purpose of Planning and hierarchy of planning and also analyze its types ,Decision making, Organizing, Staffing, Directing and Controlling
3	15ME351.3	Select the best economic model from various available alternatives
4	15ME351.4	Understand various interest rate methods and implement the suitable one
5	15ME351.5	Estimate various depreciation values of commodities
SUBJECT: 15ME52-DOM		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME352.1	**Determine** the forces and couples for static and dynamic conditions of four bars and slider crank mechanisms to keep the system in equilibrium.
2	15ME352.2	**Determine** magnitude and angular position of balancing masses under static and dynamic condition of rotating masses in same and different planes and determine unbalanced primary, secondary forces and couples in single and multi-cylinder engine.
3	15ME352.3	**Determine** sensitiveness, isochronisms, effort and power of porter and Hartnell governors. Determine gyroscopic couple and effects related to 2, 4 wheeler, plane disc, ship and aeroplanes.
4	15ME352.4	**Understand** types of vibration, SHM and methods of finding natural frequencies of simple mechanical systems.
5	15ME352.5	**Determine** equation of motion, natural frequency, damping factor, logarithmic decrement of damped free-vibration (SDOF) systems. Determine equation of motion of rotating and reciprocating unbalance systems, magnification factor, and transmissibility, concepts of forced vibration (SDOF) systems.
SUBJECT: 15ME53-TM		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME353.1	**Apply** model studies and thermodynamic concepts in solving turbo machines problems.
2	15ME353.2	**Evaluate** turbo machines using concepts of turbine equations and velocity triangles.
3	15ME353.3	**Analyse** and **evaluate** performance of impulse and reaction steam turbines.
4	15ME353.4	**Analyse** and **evaluate** performance of hydraulic turbines.
5	15ME353.5	**Analyse** and **evaluate** performance of power absorbing turbo machines.
SUBJECT: 15ME54-DME1		
SL NO	SUB CODE	COURSE OUTCOME

1	15ME354.1	Describe the design process, choose materials and use codes& standards.
2	15ME354.2	Analyze the behavior of machine components under static, impact and fatigue loads using failure theories
3	15ME354.3	Design shafts, joints and couplings computing the power transmission requirements.
4	15ME354.4	Analyze the forces and Design riveted & welded joints.
5	15ME354.5	Design threaded fasteners and power screws determining the forces and power transmission requirements
SUBJECT: 15ME552-TOE		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME3552.1	**Understand** and **apply** the state of stress in 2D and 3D elastic members subjected to direct loads and thermal loads.
2	15ME3552.2	**Understand** and **apply** the state of strain in 2D and 3D elastic members subjected to direct loads and thermal loads.
3	15ME3552.3	**Analyse** the structural members: beam, rotating disks, columns
4	15ME3552.4	**Analyse** the torsional rigidity of circular and non-circular sections.
5	15ME3552.5	**Analyse** the stability of columns
SUBJECT: 15ME554-NTM		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME3554.1	Learn to select particular Non-traditional machining process for an engineering applications; compare it with the traditional machining process.
2	15ME3554.2	Understand the process principle, constructional features, performance parameters, process characteristics of USM, AJM and WJM.
3	15ME3554.3	Illustrate the constructional features, process parameters, process characteristics of Chemical and electro-chemical machining process.
4	15ME3554.4	Understand the constructional features, process parameters, process characteristics of EDM & PAM.
5	15ME3554.5	Understand the equipment, parameters, characteristics, mechanism of metal removal of LBM & EBM.
SUBJECT: 15ME562-E&E		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME3562.1	**Analyze** global energy scenario and the key energy trends in India.
2	15ME3562.2	**Evaluate** different energy storage systems, principles of energy management, methods of energy audit and economic analysis.
3	15ME3562.3	**Classify** ecosystem and illustrate energy cycles.
4	15ME3562.4	**Identify** various types of environmental pollution with their causes and effects.

5	15ME3562.5	**Interpret** social issues related to the environment with associated acts.
SUBJECT: 15MEL57-FM LAB		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME357.1	To calibrate different flow measuring devices.
2	15ME357.2	To estimate head losses in pipes and force developed by impact of jet on vanes.
3	15ME357.3	To conduct performance tests on power generating turbo machines-Impulse turbine.
4	15ME357.4	To carry out performance tests on power absorbing turbo machines and positive displacement machine.
5	15ME357.5	To conduct performance tests on power generating turbo machines-Reaction turbine
SUBJECT: 15MEL58-EC LAB		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME358.1	**Analyze and** Perform experiments to determine the properties of fuels and various grades oils.
2	15ME358.2	**Analyze** and Conduct experiments on engines to draw characteristics curves. Test basic performance parameters of I.C. Engine and implement the knowledge in industry
3	15ME358.3	**Determine** the energy flow pattern through the I C Engine and identify exhaust emission, factors affecting them and report the remedies.
4	15ME358.4	Exhibit his competency towards preventive maintenance of stroke2 IC engines.
5	15ME358.5	Exhibit his competency towards preventive maintenance of 4 stroke IC engines
SUBJECT: 15ME61-FEM		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME361.1	Understand the concept behind formulation methods in FEM.
2	15ME361.2	Identify the application and characteristics of FEA elements such as bars, truss, plane and iso-parametric elements
3	15ME361.3	Formulate the Finite Element model for beams and shafts subjected to various loading conditions.
4	15ME361.4	Develop element characteristic equations and generation of global equations for heat transfer and fluid flow problems.
5	15ME361.5	Able to apply suitable boundary conditions to a global equation for axi-symmetric and dynamic problems.
SUBJECT: 15ME62-CIM		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME362.1	Able to define Automation, CIM,CAD,CAM and explain

		The differences between these concepts. Solve simple Problems of transformations of entities on computer screen.
2	15ME362.2	Explain the basics of automated manufacturing Industries through mathematical models and analyze Different types of automated flow line
3	15ME362.3	Analyze the automated flow lines to reduce downtime And enhance productivity.
4	15ME362.4	Analyze the automated flow lines to reduce downtime And enhance productivity
5	15ME362.5	Visualize and appreciate the modern trends in Manufacturing like additive manufacturing,Industry4.0 And applications of Internet of Things leading to Smart Manufacturing..
SUBJECT: 15ME63-HMT		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME363.1	Understand the basic modes of heat transfer to Compute temperature distribution in steady-state and unsteady-state heat conduction
2	15ME363.2	Analyse the heat transfer through extended surfaces. And transient heat conduction
3	15ME363.3	Analyse the heat conduction by numerical method and explain the principle of radiation Heat transfer
4	15ME363.4	Analyse the forced and free convective heat transfer.
5	15ME363.5	Design of heat exchangers using LMTD, NTU methods and analyse the boiling and condensation
SUBJECT: 15ME64-DME II		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME364.1	Apply engineering design tools to product design. Analyze stresses in curved beams and compound cylinders.
2	15ME364.2	Design mechanical systems involving springs, ropes, belts and pulleys
3	15ME364.3	Analyze speed & power transmission requirements to design different types of gears and simple gear boxes for engineering applications. .
4	15ME364.4	Design effective power transmission coupling and control devices like clutches and brakes. Also to analyze support reactions and design or recommend reliable bearings from the manufacturer's catalogue.
5	15ME364.5	Design and produce assembly drawings of a mechanical system that integrates machine elements like belts, pulleys, gears, springs, bearings, clutches and brakes and learn to work in a team.
SUBJECT: 15ME655-AE		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME3655.1	Comprehend IC engines types and their construction, types of combustion chambers, need and methods to create swirl, cooling and lubrication
2	15ME3655.2	Demonstrate the knowledge of engine power transmission systems, types of clutches and speed. control systems. Knowledge of ABS and its use
3	15ME3655.3	Realize the need for: direction control system, suspension systems and

		Ignition systems.
4	15ME3655.4	Understand the fuel supply systems, combustion process and improving it by the use of super-charging.
5	15ME3655.5	Understand different types of emissions in IC engines, methods to control emissions and also understand standards for automotive emissions.
SUBJECT: 15ME662-IS		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME3662.1	Explain the basic safety terms and identify the hazards around the work environment
2	15ME3662.2	Identify the fire hazards and demonstrate the portable extinguishers used for different classes of fires. Identify the sign boards.
3	15ME3662.3	Identify the mechanical hazards. Use the safe measures in workshops, machine shops and handling of materials.
4	15ME3662.4	Identify the electrical hazards around work environment. Acquire the knowledge of safe measures while performing work in electric plant, residential building.
5	15ME3662.5	Identify the chemical hazards around work environment. Use safe measures in chemical labs and chemical plant.
SUBJECT: 15MEL67-HT LAB		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME367.1	**Conduct** experiments to Determine the thermal conductivity of a metal rod and effective thermal resistance in composite slabs
2	15ME367.2	**Conduct** experiments to evaluate effectiveness, efficiency of pin -fin, convective heat transfer coefficient for free and forced convection and correlate with theoretical values.
3	15ME367.3	**Determine** surface emissivity of a test plate and Stefan Boltzmann Constant using experiments.
4	15ME367.4	**Evaluate** performance of a refrigerator and air conditioning unit
5	15ME367.5	**Calculate** temperature distribution of study and transient heat conduction through plane wall, cylinder and fin using numerical approach (ANSYS/CFD package)(Self Learning Exercises)
SUBJECT: 15MEL68-M & A LAB		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME368.1	**Solve** and **Analyze** problems of one dimensional problem theoretically as well as using a software package Ansys.
2	15ME368.2	**Solve** and **Analyze** problems on complex trusses for stresses and deformations developed using software package Ansys..
3	15ME368.3	**Solve** and **Analyze** beam problems subjected to various loading conditions for stresses and deformations FEA software package Ansys.
4	15ME368.4	**Solve** and **Analyze** problems on plates subjected to various loading conditions for stresses and deformations.
5	15ME368.5	**Solve** and **Analyze** complex thermal analysis problems of 1D and 2D For temperature distribution and thermal flux. **Solve** and **Analyze** complex dynamic analysis problems on beam structures

		for establishing natural frequency.
SUBJECT: 15ME71-EE		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME471.1	Understand the basic concepts of thermal energy systems.
2	15ME471.2	Identify renewable energy sources and their utilization.
3	15ME471.3	Analyse the concepts of solar radiation and study the working of solar PV and thermal systems.
4	15ME471.4	Demonstrate principles of energy conversion from alternate sources including wind, tides.
5	15ME471.5	Illustrate the concepts and applications of fuel cells, biomass, thermoelectric convertor and MHD generator and study of energy storage for specific applications. Concept of green energy.
SUBJECT: 15ME72-FPS		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME472.1	**Illustrate the concept of fluid power transmission system with the Pascal's principle**
2	15ME472.2	**Demonstrate construction and working of pumps, accumulators and actuators and analysis of their performance characteristics.**
3	15ME472.3	**Under the working principle of DCV, PCV and FCV, design and analysis of hydraulic circuits**
4	15ME472.4	**Use the concept of actuators and CV to explain construction and working of pneumatic systems**
5	15ME472.5	**Explain pneumatic control system, actuators, signal processing elements in pneumatics and applications.**
SUBJECT: 15ME73-CE		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME473.1	Understand basic types, definitions, applications of control systems. Determine the transfer function of Mechanical systems, Block diagrams, and Signal flow graph.
2	15ME473.2	Analyse a first order or second order system for its transient and steady state time response.
3	15ME473.3	Analyse stability of a Control system using RH criterion and effect of forward path gain using root locus.
4	15ME473.4	Synthesis of stability of a control system using frequency domain analysis by Bode Plot, Polar plot, Nyquist plot.
5	15ME473.5	Evaluate state model and its solution using Modern control theory

		including understanding of digital control system.
SUBJECT: 15ME745-SM		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME4745.1	Understandthe concepts of smart materials like piezoelectric crystals, SMAs, methods of controlling vibration using smart systems.
2	15ME4745.2	Realize theprinciple of MR and ER Fluids and optical fiber technology in mechanical systems.
3	15ME4745.3	Adopt the concepts of Smart materials in vibration controls & Biomimetic sensors
4	15ME4745.4	Apply fabrication methods of MEMS and Piezoelectric Sensing and Actuation
5	15ME4745.5	Encapsulate MEMS Product development, know the types of Polymer MEMS& Micro fluidics: used in MEMS and micro sensor applications.
SUBJECT: 15MEL763-MTR		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME4763.1	Illustrate various components of Mechatronics systems.
2	15ME4763.2	Provide the need for interdisciplinary study in technology education by integrating mechanical engineering with other streams of enginering
3	15ME4763.3	Understand the applications of microprocessors in various systems and to know the functions of each element and PLC concepts and applications
4	15ME4763.4	Design mechanical ,electrical,pneumatic and hydraulic system for a suitable application
5	15ME4763.5	Demonstrate the integration philosophy in view of Mechatronics technology
SUBJECT: 15MEL76-DES LAB		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME476.1	**Apply** the essence of kinetics and dynamics through experiments.
2	15ME476.2	**Analyze** the stresses developed in an object through photo elasticity implementation and concept of stress concentration in design.
3	15ME476.3	**Apply** the flow pressure distribution across and along the Journal bearing.
4	15ME476.4	**Analyze** experiments to obtain the mechanical behaviour Strain guges
5	15ME476.5	**Analyze** experiments to obtain the mechanical behaviour strain rosetts and gyroscope.
SUBJECT: 15MEL67-HT LAB		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME477.1	**Conduct** experiments to Determine the thermal conductivity of a metal rod and effective thermal resistance in composite slabs
2	15ME477.2	**Conduct** experiments to evaluate effectiveness, efficiency of pin -fin, convective heat transfer coefficient for free and forced convection and correlate with theoretical values.
3	15ME477.3	**Determine** surface emissivity of a test plate and Stefan Boltzmann Constant using experiments.
4	15ME477.4	**Evaluate** performance of a refrigerator and air conditioning unit
5	15ME477.5	**Calculate** temperature distribution of study and transient heat conduction through

		plane wall, cylinder and fin using numerical approach (ANSYS/CFD package)(Self Learning Exercises)
SUBJECT: 15MEL77-CIM and Automation LAB		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME477.1	**Develop** fundamental skills to write manual part programming for various milling operations.
2	15ME477.2	**Develop** knowledge to write manual part programming for various turning operations. Operations.
3	15ME477.3	**Evaluate** the use of premium CAM software UG for generating tool path and G & M codes.
4	15ME477.4	**Analyze** for the design and analysis of Robotics and FMS
5	15ME477.5	**Analyze** hydraulics software for the design and analysis of hydraulic circuits
SUBJECT: 15ME81-OR		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME481.1	Formulate the practical problems as a linear program and interpret the optimal solution & perform analysis using Graphical techniques.
2	15ME481.2	Solving the Linear programming problems using OR mathematical tools and techniques in finding optimal solutions to problems
3	15ME481.3	Formulate, solve and analyze the Transportation, Assignment and travelling salesman problems and formulate practical problems to validate the optimal solution & perform analysis using OR techniques.
4	15ME481.4	Demonstrate the concepts of network analysis techniques to solve practical problems and Understand the mathematical analysis of competitive problems and identify the statistical description of the behaviour of Queues.
5	15ME481.5	Interpret technical & managerial problems and to take efficient decisions for the improvement of the productivity as a whole.
SUBJECT: 15ME82-AM		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME482.1	Able to define Automation, CIM, CAD, CAM and explain the differences between these concepts. Solve simple problems of transformations of entities on computer screen.
2	15ME482.2	Explain the basics of automated manufacturing industries through mathematical models and analyze different types of automated flow line
3	15ME482.3	Analyze the automated flow lines to reduce down time and enhance productivity.
4	15ME482.4	Analyze the automated flow lines to reduce down time and enhance productivity.
5	15ME482.5	Visualize and appreciate the modern trends in Manufacturing like additive manufacturing,Industry 4.0 and applications of Internet of Things leading to Smart Manufacturing..
SUBJECT: 15ME83-PLM		
SL	SUB CODE	COURSE OUTCOME

NO		
1	15ME4835.1	**Explain** the various strategies of PLM and Product Data Management.
2	15ME4835.2	**Understand** decomposition of product design and model simulation.
3	15ME4835.3	**Apply** the concept of New Product Development and its structuring.
4	15ME4835.4	**Analyse** the technological forecasting and the tools in the innovation.
5	15ME4835.5	**Apply** the virtual product development and model analysis.
SUBJECT: 15MEL85-PROJECT		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME485.1	Identify and interpret the realistic mechanical engineering problems and related systems.
2	15ME485.2	Apply the basic principles and concepts of mechanical engineering in real world systems based on professional ethics and responsibilities
3	15ME485.3	Criticize and experiment to achieve optimum solutions for mechanical engineering problems.
4	15ME485.4	Analyse, evaluate and review the obtained solution for problems in mechanical engineering systems.
5	15ME485.5	Able to use the tools and learn fabrication, design and work in teams
SUBJECT: 15MEL86-SEMINAR		
SL NO	SUB CODE	COURSE OUTCOME
1	15ME486.1	Information search and analysis of state-of-art technologies in the field of Mechanical Engineering
2	15ME486.2	Identify and understand the need to be knowledgeable of contemporary issues as a mechanical engineer
3	15ME486.3	Communicate effectively in profession and project management.
4	15ME486.4	Able to use modern tools of presentation techniques
5	15ME486.5	Able to refer Literature survey from Journal papers

17MAT31-ABC

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

ESTD : 2001 An Institution with a Difference

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2017
SESSION	AUG-DEC2018
SUBJECT	Mathematics-3
SEMESTER	3-ABC
SUB CODE	17MAT31

CLASS STRENGTH	162
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage	
Tests IA	Quiz + Assign
100%	0%

CO PO Mapping : At the end of the course the student will be able to	
CO1	Know the use of periodic signals and fourier series to analyse circuits and system communications.
CO2	Explain the general linear system theory for continous-time signals and digital signal processing using the Fourier Transform
CO3	Employ appropriate numerical methods to solve algebraic and transcendental equations
CO4	Apply Green's theorem, Divergence theorem and Stoke's theorem in variouys applications in the field of electro- magnetic and gravtitaional fields and fluid flow problems.
CO5	Determine the extremals of functionals and solve the simple problems of the calculus of variations

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17MAT31.1	CO1	3	3	3	1	2	2	2	1	1	2	2	3	1	2	0		
C17MAT31.2	CO2	3	3	3	2	2	2	2	1	1	2	2	3	2	2	0		
C17MAT31.3	CO3	3	3	3	1	1	1	1	1	1	1	1	3	2	3	0		
C17MAT31.4	CO4	3	3	3	2	2	2	2	1	2	2	2	3	3	2	0		
C17MAT31.5	CO5	3	3	3	2	2	2	2	1	2	2	2	3	3	2	0		
CO - PO LEVEL		3.0	3.0	3.0	1.6	1.8	1.8	1.8	1.0	1.4	1.8	1.8	3.0	2.2	2.2	0.0		

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	115	71%
CO2	115	71%
CO3	115	71%
CO4	115	71%
CO5	115	71%

Targets for SEE			Targets for InA		
ABOVE	60%	3	75%	3	
ABOVE	50%	2	60%	2	
ABOVE	45%	1	45%	1	

COURSE OUTCOMES	CO ATTAINMENT LEVEL						INDIRECT		TA	
	IA		SEE		FINAL					
CO1	71%	2	59%	2	61%	2	80%	3	63%	2
CO2	71%	2	59%	2	61%	2	77%	3	63%	2
CO3	71%	2	59%	2	61%	2	74%	2	62%	2
CO4	71%	2	59%	2	61%	2	74%	2	62%	2
CO5	71%	2	59%	2	61%	2	78%	3	63%	2

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17MAT31.1	CO1	2.13	2.13	2.13	0.71	1.42	1.42	1.42	0.71	0.71	1.42	1.42	2.13	0.71	1.42	0.00		
C17MAT31.2	CO2	2.13	2.13	2.13	1.42	1.42	1.42	1.42	0.71	0.71	1.42	1.42	2.13	1.42	1.42	0.00		
C17MAT31.3	CO3	2.13	2.13	2.13	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	2.13	1.42	2.13	0.00		
C17MAT31.4	CO4	2.13	2.13	2.13	1.42	1.42	1.42	1.42	0.71	1.42	1.42	1.42	2.13	2.13	1.42	0.00		
C17MAT31.5	CO5	2.13	2.13	2.13	1.42	1.42	1.42	1.42	0.71	1.42	1.42	1.42	2.13	2.13	1.42	0.00		
DIRECT ATTAINMENT		2.13	2.13	2.13	1.14	1.28	1.28	1.28	0.71	0.99	1.28	1.28	2.13	1.56	1.56	0.00		

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
SEMESTER END EXAMINATION	1.76	1.76	1.76	0.94	1.06	1.06	1.06	0.59	0.82	1.06	1.06	1.76	1.29	1.29	0.00		
ASSIGNMENT AND QUIZ\	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
CONTINUOUS INTERNAL EVALUATION	2.13	2.13	2.13	1.14	1.28	1.28	1.28	0.71	0.99	1.28	1.28	2.13	1.56	1.56	0.00		
FINAL DIRECT ATTAINMENT	1.83	1.83	1.83	0.98	1.10	1.10	1.10	0.61	0.86	1.10	1.10	1.83	1.34	1.34	0.00		

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
FINAL DIRECT ATTAINMENT	1.83	1.83	1.83	0.98	1.10	1.10	1.10	0.61	0.86	1.10	1.10	1.83	1.34	1.34	0.00		
PROGRAM EXIT SURVEY	2.31	2.31	2.31	1.23	1.39	1.39	1.39	0.77	1.07	1.39	1.39	2.31	1.68	1.69	0.00		
FINAL ATTAINMENT	1.88	1.88	1.88	1.00	1.13	1.13	1.13	0.63	0.88	1.13	1.13	1.88	1.38	1.38	0.00		

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

ESTD : 2001 An Institution with a Difference

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2017
SESSION	Aug - Dec 2018
SUBJECT	MSM
SEMESTER	3-AC
SUB CODE	17ME32

CLASS STRENGTH	105
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage	
Tests IA	Quiz + Assign
100%	0%

CO PO Mapping : At the end of the course the student will be able to	
CO1	Describe the mechanical properties of metals, their alloys and various modes of failure.
CO2	Understand the microstructures of ferrous and non-ferrous materials to mechanical properties. further to use the available of results to draw shear force and bending moment diagrams.
CO3	Explain the processes of heat treatment of various alloys.
CO4	Understand the properties and potentialities of various materials available and material selection procedures.
CO5	Know about composite materials and their processing as well as applications.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17ME32.1	CO1	3	3	2	0	0	1	1	0	0	1	0	1	1	1	0		
C17ME32.2	CO2	3	2	2	0	0	1	1	0	0	0	0	1	1	1	0		
C17ME32.3	CO3	3	2	0	0	0	0	0	0	0	0	1	1	1	1	0		
C17ME32.4	CO4	3	2	2	0	0	2	0	0	0	0	0	1	1	1	0		
C17ME32.5	CO5	3	2	2	0	0	1	0	0	0	0	0	1	1	1	0		
CO - PO LEVEL		3.0	2.2	2.0	0.0	0.0	1.3	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0		

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	94	90%
CO2	94	90%
CO3	94	90%
CO4	94	90%
CO5	94	90%

Targets for SEE			Targets for InA		
ABOVE	60%	3	75%	3	
ABOVE	50%	2	60%	2	
ABOVE	45%	1	45%	1	

COURSE OUTCOMES	CO ATTAINMENT LEVEL						INDIRECT		TA	
	IA		SEE		FINAL					
CO1	90%	3	78%	3	80%	3	80%	3	80%	3
CO2	90%	3	78%	3	80%	3	77%	3	80%	3
CO3	90%	3	78%	3	80%	3	74%	2	80%	3
CO4	90%	3	78%	3	80%	3	74%	2	80%	3
CO5	90%	3	78%	3	80%	3	78%	3	80%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17ME32.1	CO1	2.69	2.69	1.79	0.00	0.00	0.90	0.90	0.00	0.00	0.90	0.00	0.90	0.90	0.90	0.00		
C17ME32.2	CO2	2.69	1.79	1.79	0.00	0.00	0.90	0.90	0.00	0.00	0.00	0.00	0.90	0.90	0.90	0.00		
C17ME32.3	CO3	2.69	1.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90	0.90	0.90	0.90	0.00		
C17ME32.4	CO4	2.69	1.79	1.79	0.00	0.00	1.79	0.00	0.00	0.00	0.00	0.00	0.90	0.90	0.90	0.00		
C17ME32.5	CO5	2.69	1.79	1.79	0.00	0.00	0.90	0.00	0.00	0.00	0.00	0.00	0.90	0.90	0.90	0.00		
DIRECT ATTAINMENT		2.69	1.97	1.79	0.00	0.00	1.12	0.90	0.00	0.00	0.90	0.90	0.90	0.90	0.90	0.00		

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
SEMESTER END EXAMINATION	2.34	1.72	1.56	0.00	0.00	0.98	0.78	0.00	0.00	0.78	0.78	0.78	0.78	0.78	0.00		
ASSIGNMENT AND QUIZ\	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
CONTINUOUS INTERNAL EVALUATION	2.69	1.97	1.79	0.00	0.00	1.12	0.90	0.00	0.00	0.90	0.90	0.90	0.90	0.90	0.00		
FINAL DIRECT ATTAINMENT	2.41	1.77	1.61	0.00	0.00	1.00	0.80	0.00	0.00	0.80	0.80	0.80	0.80	0.80	0.00		

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
FINAL DIRECT ATTAINMENT	2.41	1.77	1.61	0.00	0.00	1.00	0.80	0.00	0.00	0.80	0.80	0.80	0.80	0.80	0.00		
PROGRAM EXIT SURVEY	2.31	1.70	1.55	0.00	0.00	0.96	0.79	0.00	0.00	0.80	0.74	0.77	0.77	0.77	0.00		
FINAL ATTAINMENT	2.40	1.76	1.60	0.00	0.00	1.00	0.80	0.00	0.00	0.80	0.80	0.80	0.80	0.80	0.00		

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	LBW

BATCH	2018-2019
SESSION	AUG2018 To DEC 2018
SUBJECT	MSM
SEMESTER	3B
SUB CODE	17ME32

CLASS STRENGTH	52
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Describe the mechanical properties of metals, their alloys and various modes of failure.
CO2	Understand the microstructures of ferrous and non-ferrous materials to mechanical properties.
CO3	Explain the processes of heat treatment of various alloys.
CO4	Understand the properties and potentialities of various materials available and material selection procedures.
CO5	Know about composite materials and their processing as well as applications.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME32.1	CO1	3	3	2	0	0	1	1	0	0	1	0	1	1	1	0
C17ME32.2	CO2	3	2	2	0	0	1	1	0	0	0	0	1	1	1	0
C17ME32.3	CO3	3	2	0	0	0	0	0	0	0	0	1	1	1	1	0
C17ME32.4	CO4	3	2	2	0	0	2	0	0	0	0	0	1	1	1	0
C17ME32.5	CO5	3	2	2	0	0	1	0	0	0	0	0	1	1	1	0
CO - PO LEVEL		3.0	2.2	2.0	0.0	0.0	1.3	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	31	59.62%	95%	88%
CO2	21	41.18%	95%	84%
CO3	38	73.08%	95%	91%
CO4	41	78.85%	95%	92%
CO5	39	75.00%	95%	91%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	88%	3	80.5%	3	87%	3
CO2	84%	3	77.3%	3	83%	3
CO3	91%	3	74.2%	2	89%	3
CO4	92%	3	74.3%	2	90%	3
CO5	91%	3	78.4%	3	90%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME32.1	CO1	1.79	1.79	1.19	0.00	0.00	0.60	0.60	0.00	0.00	0.60	0.00	0.60	0.60	0.60	0.00
C17ME32.2	CO2	1.24	0.82	0.82	0.00	0.00	0.41	0.41	0.00	0.00	0.00	0.00	0.41	0.41	0.41	0.00
C17ME32.3	CO3	2.19	1.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.73	0.73	0.73	0.73	0.00
C17ME32.4	CO4	2.37	1.58	1.58	0.00	0.00	1.58	0.00	0.00	0.00	0.00	0.00	0.79	0.79	0.79	0.00
C17ME32.5	CO5	2.25	1.50	1.50	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.75	0.75	0.75	0.00
DIRECT ATTAINMENT		1.97	1.43	1.27	0.00	0.00	0.83	0.50	0.00	0.00	0.60	0.73	0.66	0.66	0.66	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.85	2.09	1.90	0.00	0.00	1.19	0.95	0.00	0.00	0.95	0.95	0.95	0.95	0.95	0.00
ASSIGNMENT AND QUIZ	0.60	0.44	0.40	0.00	0.00	0.25	0.20	0.00	0.00	0.20	0.20	0.20	0.20	0.20	0.00
CONTINUOUS INTERNAL EVALUATION	1.57	1.14	1.02	0.00	0.00	0.67	0.40	0.00	0.00	0.48	0.58	0.52	0.52	0.52	0.00
FINAL DIRECT ATTAINMENT	2.71	1.99	1.80	0.00	0.00	1.13	0.88	0.00	0.00	0.89	0.92	0.90	0.90	0.90	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.71	1.99	1.80	0.00	0.00	1.13	0.88	0.00	0.00	0.89	0.92	0.90	0.90	0.90	0.00
COURSE EXIT SURVEY	2.31	1.70	1.55	0.00	0.00	0.96	0.79	0.00	0.00	0.80	0.74	0.77	0.77	0.77	0.00
FINAL ATTAINMENT	2.67	1.96	1.78	0.00	0.00	1.12	0.87	0.00	0.00	0.89	0.90	0.89	0.89	0.89	0.00
% OF Attainment	89.1	89.0	88.9	0.0	0.0	89.2	87.1	0.0	0.0	88.6	89.9	89.1	89.1	89.1	0.0

17ME32-MS-C

17ME33-BTD-A

Total Outcome																
COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C18ME33.1	CO1	3	3	2			1	1			1		1	1	1	
C18ME33.2	CO2	3	2	2			1	1					1	1	1	
C18ME33.3	CO3	3	2									1	1	1	1	
C18ME33.4	CO4	3	2	2			2						1	1	1	
C18ME33.5	CO5	3	2	2			1						1	1	1	
CO - PO LEVEL		3.0	2.2	2.0	0.0	0.0	1.3	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	41	82.00%
CO2	24	46.15%
CO3	15	31.91%
CO4	51	98.08%
CO5	40	76.92%

Targets for SEE			Targets for InA		
E	60%	3	75%	3	
E	50%	2	60%	2	
E	45%	1	45%	1	

COURSE OUTCOMES	ATTAINMENT LEVEL								
	IA		SEE		FINAL		Indirect Attainment		Final
CO1	82.00%	3	38%	0	47%	1	81%	3	1.2
CO2	46.15%	1	38%	0	39%	0	75%	3	0.3
CO3	31.91%	0	38%	0	37%	0	75%	3	0.3
CO4	98.08%	3	38%	0	50%	1	73%	2	1.1
CO5	76.92%	3	38%	0	46%	1	76%	3	1.2

Direct Attainment of PO from Internal Assessment																
COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C18ME33.1	CO1	2.46	2.46	1.64	0.00	0.00	0.82	0.82	0.00	0.00	0.82	0.00	0.82	0.82	0.82	0.00
C18ME33.2	CO2	1.38	0.92	0.92	0.00	0.00	0.46	0.46	0.00	0.00	0.00	0.00	0.46	0.46	0.46	0.00
C18ME33.3	CO3	0.96	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.32	0.32	0.32	0.00
C18ME33.4	CO4	2.94	1.96	1.96	0.00	0.00	1.96	0.00	0.00	0.00	0.00	0.00	0.98	0.98	0.98	0.00
C18ME33.5	CO5	2.31	1.54	1.54	0.00	0.00	0.77	0.00	0.00	0.00	0.00	0.00	0.77	0.77	0.77	0.00
DIRECT ATTAINMENT		2.01	1.50	1.52	0.00	0.00	1.00	0.64	0.00	0.00	0.82	0.32	0.67	0.67	0.67	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES															
All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.13	0.83	0.75	0.00	0.00	0.47	0.38	0.00	0.00	0.38	0.38	0.38	0.38	0.38	0.00
ASSIGNMENT AND QUIZ	0.59	0.43	0.39	0.00	0.00	0.25	0.20	0.00	0.00	0.20	0.20	0.20	0.20	0.20	0.00
CONTINUOUS INTERNAL EVALUATION	1.61	1.20	1.21	0.00	0.00	0.80	0.51	0.00	0.00	0.66	0.26	0.54	0.54	0.54	0.00
FINAL DIRECT ATTAINMENT	1.35	0.99	0.92	0.00	0.00	0.59	0.44	0.00	0.00	0.47	0.39	0.45	0.45	0.45	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES															
All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.35	0.99	0.92	0.00	0.00	0.59	0.44	0.00	0.00	0.47	0.39	0.45	0.45	0.45	0.00
PROGRAM EXIT SURVEY	2.28	1.68	1.53	0.00	0.00	0.95	0.78	0.00	0.00	0.81	0.75	0.76	0.76	0.76	0.00
FINAL ATTAINMENT	1.44	1.06	0.98	0.00	0.00	0.62	0.48	0.00	0.00	0.51	0.43	0.48	0.48	0.48	0.00

17ME33-

17ME33-BTD-B

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2015 - 19
SESSION	AUG - DEC 2018
SUBJECT	BASIC THERMODYNAMICS
SEMESTER	3-A
SUB CODE	18ME33

CLASS STRENGTH	56
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUAT	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage	
Tests IA	Quiz + Assign
80%	20%

CO PO Mapping

CO1	re scales work, and heat interactions for different types scales work, and heat interactions for different type
CO2	of work to flow & non flow process by applying 1st Law f work to flow & non flow process by applying 1st Law
CO3	elations, for a reversible and irreversible processes der ations, for a reversible and irreversible processes de
CO4	PT, PV, TH diagrams and its applications, discussing the T, PV, TH diagrams and its applications, discussing the
CO5	d its mixtures. Also real gases at all ranges of pressure, its mixtures. Also real gases at all ranges of pressure,

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C18ME33.1	CO1	3	3	2			1	1			1		1	1	1	
C18ME33.2	CO2	3	2	2			1	1					1	1	1	
C18ME33.3	CO3	3	2									1	1	1	1	
C18ME33.4	CO4	3	2	2			2						1	1	1	
C18ME33.5	CO5	3	2	2			1						1	1	1	
CO - PO LEVEL		3.0	2.2	2.0	0.0	0.0	1.3	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	33	60.00%
CO2	22	39.29%
CO3	10	19.61%
CO4	52	92.86%
CO5	49	87.50%

Targets for SEE			Targets for InA		
E	60%	3	75%	3	
E	50%	2	60%	2	
E	45%	1	45%	1	

COURSE OUTCOMES	ATTAINMENT LEVEL								
	IA		SEE		FINAL		Indirect Attainment		Final
CO1	60.00%	2	55%	2	50%	1	81%	3	1.2
CO2	39.29%	0	55%	2	48%	1	75%	3	1.2
CO3	19.61%	0	55%	2	46%	1	75%	3	1.2
CO4	92.86%	3	55%	2	54%	1	73%	2	1.1
CO5	87.50%	3	55%	2	53%	1	76%	3	1.2

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C18ME33.1	CO1	1.80	1.80	1.20	0.00	0.00	0.60	0.60	0.00	0.00	0.60	0.00	0.60	0.60	0.60	0.00
C18ME33.2	CO2	1.18	0.79	0.79	0.00	0.00	0.39	0.39	0.00	0.00	0.00	0.00	0.39	0.39	0.39	0.00
C18ME33.3	CO3	0.59	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.20	0.20	0.20	0.00
C18ME33.4	CO4	2.79	1.86	1.86	0.00	0.00	1.86	0.00	0.00	0.00	0.00	0.00	0.93	0.93	0.93	0.00
C18ME33.5	CO5	2.63	1.75	1.75	0.00	0.00	0.88	0.00	0.00	0.00	0.00	0.00	0.88	0.88	0.88	0.00
DIRECT ATTAINMENT		1.80	1.32	1.40	0.00	0.00	0.93	0.50	0.00	0.00	0.60	0.20	0.60	0.60	0.60	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.66	1.22	1.11	0.00	0.00	0.69	0.55	0.00	0.00	0.55	0.55	0.55	0.55	0.55	0.00
ASSIGNMENT AND QUIZ	0.60	0.44	0.40	0.00	0.00	0.25	0.20	0.00	0.00	0.20	0.20	0.20	0.20	0.20	0.00
CONTINUOUS INTERNAL EVALUATION	1.44	1.05	1.12	0.00	0.00	0.75	0.40	0.00	0.00	0.48	0.16	0.48	0.48	0.48	0.00
FINAL DIRECT ATTAINMENT	1.74	1.27	1.19	0.00	0.00	0.75	0.56	0.00	0.00	0.58	0.51	0.58	0.58	0.58	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.74	1.27	1.19	0.00	0.00	0.75	0.56	0.00	0.00	0.58	0.51	0.58	0.58	0.58	0.00
PROGRAM EXIT SURVEY	2.28	1.68	1.53	0.00	0.00	0.95	0.78	0.00	0.00	0.81	0.75	0.76	0.76	0.76	0.00
FINAL ATTAINMENT	1.79	1.31	1.22	0.00	0.00	0.77	0.58	0.00	0.00	0.60	0.54	0.60	0.60	0.60	0.00

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

ESTD : 2001 An Institution with a Difference

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2015 - 19
SESSION	Feb - Jun 2018
SUBJECT	BASIC THERMODYNAMICS
SEMESTER	3-A
SUB CODE	18ME33

CLASS STRENGTH	36
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUAT	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage	
Tests IA	Quiz + Assign
80%	20%

CO PO Mapping

CO1	ture scales work, and heat interactions for different types o scales work, and heat interactions for different type
CO2	s of work to flow & non flow process by applying 1st Law & work to flow & non flow process by applying 1st Law
CO3	relations, for a reversible and irreversible processes derive ations, for a reversible and irreversible processes de
CO4	g PT, PV, TH diagrams and its applications, discussing the av T, PV, TH diagrams and its applications, discussing the
CO5	nd its mixtures. Also real gases at all ranges of pressure, te its mixtures. Also real gases at all ranges of pressure,

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C18ME33.1	CO1	3	3	2			1	1			1		1	1	1	
C18ME33.2	CO2	3	2	2			1	1					1	1	1	
C18ME33.3	CO3	3	2									1	1	1	1	
C18ME33.4	CO4	3	2	2			2						1	1	1	
C18ME33.5	CO5	3	2	2			1						1	1	1	
CO - PO LEVEL		3.0	2.2	2.0	0.0	0.0	1.3	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	27	75.00%
CO2	7	19.44%
CO3	26	72.22%
CO4	5	13.89%
CO5	26	72.22%

Targets for SEE			Targets for InA		
E	60%	3		75%	3
E	50%	2		60%	2
E	45%	1		45%	1

COURSE OUTCOMES	ATTAINMENT LEVEL							
	IA		SEE		FINAL		Indirect Attainment	Final
CO1	75.00%	3	17%	0	69%	2	81%	3	2.1
CO2	19.44%	0	17%	0	19%	0	75%	3	0.3
CO3	72.22%	0	17%	0	67%	2	75%	3	2.1
CO4	13.89%	0	17%	0	14%	0	73%	2	0.2
CO5	72.22%	2	17%	0	67%	2	76%	3	2.1

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C18ME33.1	CO1	2.25	2.25	1.50	0.00	0.00	0.75	0.75	0.00	0.00	0.75	0.00	0.75	0.75	0.75	0.00
C18ME33.2	CO2	0.58	0.39	0.39	0.00	0.00	0.19	0.19	0.00	0.00	0.00	0.00	0.19	0.19	0.19	0.00
C18ME33.3	CO3	2.17	1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.72	0.72	0.72	0.72	0.00
C18ME33.4	CO4	0.42	0.28	0.28	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.14	0.14	0.14	0.00
C18ME33.5	CO5	2.17	1.44	1.44	0.00	0.00	0.72	0.00	0.00	0.00	0.00	0.00	0.72	0.72	0.72	0.00
DIRECT ATTAINMENT		1.52	1.16	0.90	0.00	0.00	0.49	0.47	0.00	0.00	0.75	0.72	0.51	0.51	0.51	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	0.50	0.37	0.33	0.00	0.00	0.21	0.17	0.00	0.00	0.17	0.17	0.17	0.17	0.17	0.00
ASSIGNMENT AND QUIZ	0.57	0.42	0.38	0.00	0.00	0.24	0.19	0.00	0.00	0.19	0.19	0.19	0.19	0.19	0.00
CONTINUOUS INTERNAL EVALUATION	1.21	0.93	0.72	0.00	0.00	0.39	0.38	0.00	0.00	0.60	0.58	0.40	0.40	0.40	0.00
FINAL DIRECT ATTAINMENT	0.76	0.56	0.49	0.00	0.00	0.29	0.25	0.00	0.00	0.29	0.29	0.25	0.25	0.25	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	0.76	0.56	0.49	0.00	0.00	0.29	0.25	0.00	0.00	0.29	0.29	0.25	0.25	0.25	0.00
PROGRAM EXIT SURVEY	2.28	1.68	1.53	0.00	0.00	0.95	0.78	0.00	0.00	0.81	0.75	0.76	0.76	0.76	0.00
FINAL ATTAINMENT	0.91	0.67	0.59	0.00	0.00	0.36	0.30	0.00	0.00	0.34	0.33	0.30	0.30	0.30	0.00

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2017 - 2020
SESSION	Feb - Jun 2018
SUBJECT	BASIC THERMODYNAMICS
SEMESTER	3-C
SUB CODE	18ME33

CLASS STRENGTH	19
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUAT	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage	
Tests IA	Quiz + Assign
80%	20%

CO PO Mapping

CO1	ture scales work, and heat interactions for different types o scales work, and heat interactions for different type
CO2	s of work to flow & non flow process by applying 1st Law & work to flow & non flow process by applying 1st Law
CO3	relations, for a reversible and irreversible processes derive ations, for a reversible and irreversible processes de
CO4	g PT, PV, TH diagrams and its applications, discussing the av T, PV, TH diagrams and its applications, discussing the
CO5	nd its mixtures. Also real gases at all ranges of pressure, ter its mixtures. Also real gases at all ranges of pressure,

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C18ME33.1	CO1	3	3	2			1	1			1		1	1	1	
C18ME33.2	CO2	3	2	2			1	1					1	1	1	
C18ME33.3	CO3	3	2									1	1	1	1	
C18ME33.4	CO4	3	2	2			2						1	1	1	
C18ME33.5	CO5	3	2	2			1						1	1	1	
CO - PO LEVEL		3.0	2.2	2.0	0.0	0.0	1.3	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	16	84.21%
CO2	9	47.37%
CO3	15	78.95%
CO4	11	57.89%
CO5	16	84.21%

Targets for SEE			Targets for InA		
E	60%	3		75%	3
E	50%	2		60%	2
E	45%	1		45%	1

COURSE OUTCOMES	ATTAINMENT LEVEL							
	IA		SEE		FINAL		Indirect Attainment	Final
CO1	84.21%	3	42%	0	80%	3	81%	3	3
CO2	47.37%	1	42%	0	47%	1	75%	3	1.2
CO3	78.95%	0	42%	0	75%	3	75%	3	3
CO4	57.89%	1	42%	0	56%	1	73%	2	1.1
CO5	84.21%	3	42%	0	80%	3	76%	3	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C18ME33.1	CO1	2.53	2.53	1.68	0.00	0.00	0.84	0.84	0.00	0.00	0.84	0.00	0.84	0.84	0.84	0.00
C18ME33.2	CO2	1.42	0.95	0.95	0.00	0.00	0.47	0.47	0.00	0.00	0.00	0.00	0.47	0.47	0.47	0.00
C18ME33.3	CO3	2.37	1.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.79	0.79	0.79	0.79	0.00
C18ME33.4	CO4	1.74	1.16	1.16	0.00	0.00	1.16	0.00	0.00	0.00	0.00	0.00	0.58	0.58	0.58	0.00
C18ME33.5	CO5	2.53	1.68	1.68	0.00	0.00	0.84	0.00	0.00	0.00	0.00	0.00	0.84	0.84	0.84	0.00
DIRECT ATTAINMENT		2.12	1.58	1.37	0.00	0.00	0.83	0.66	0.00	0.00	0.84	0.79	0.71	0.71	0.71	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	126	0.93	0.84	0.00	0.00	0.53	0.42	0.00	0.00	0.42	0.42	0.42	0.42	0.42	0.00
ASSIGNMENT AND QUIZ	0.60	0.44	0.40	0.00	0.00	0.25	0.20	0.00	0.00	0.20	0.20	0.20	0.20	0.20	0.00
CONTINUOUS INTERNAL EVALUATION	169	126	109	0.00	0.00	0.66	0.53	0.00	0.00	0.67	0.63	0.56	0.56	0.56	0.00
FINAL DIRECT ATTAINMENT	1.47	1.08	0.97	0.00	0.00	0.60	0.48	0.00	0.00	0.51	0.50	0.49	0.49	0.49	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.47	1.08	0.97	0.00	0.00	0.60	0.48	0.00	0.00	0.51	0.50	0.49	0.49	0.49	0.00
PROGRAM EXIT SURVEY	2.28	1.68	1.53	0.00	0.00	0.95	0.78	0.00	0.00	0.81	0.75	0.76	0.76	0.76	0.00
FINAL ATTAINMENT	1.55	1.14	1.03	0.00	0.00	0.64	0.51	0.00	0.00	0.54	0.53	0.52	0.52	0.52	0.00

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	RB

BATCH	2018 -2019
SESSION	August 2018 To December 2018
SUBJECT	Mechanics of Materials
SEMESTER	3A
SUB CODE	17ME34

CLASS STRENGTH	53
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand simple, compound, thermal stresses and strains their relations, Poisson's ratio, Hooke's law, mechanical properties including elastic constants and their relations and to determine stresses, strains and deformations in bars with varying circular and rectangular cross sections subjected to normal and temperature loads.
CO2	Determine plane stress, principal stress, maximum shear stress and their orientations using analytical method and Mohr's circle and also stress distribution in thick and thin cylinders.
CO3	Draw SFD and BMD for different beams including cantilever beams, simply supported beams and overhanging beams subjected to UDL, UVL, Point loads and couples and to determine dimensions, bending stress, shear stress and its distribution in beams of circular, rectangular, symmetrical I and T sections subjected to point loads and UDL.
CO4	Determine the dimensions of shafts based on tensional strength, rigidity and flexibility and also elastic stability of columns using Rankin's and Euler's theory.
CO5	Explain the theories of failure and to determine the strain energy due to normal stress, shear stress, bending and torsion.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME34.1	CO1	3	3	2	0	0	1	1	1	0	0	0	1	3	0	0
C17ME34.2	CO2	3	3	1	0	0	1	1	1	0	0	0	1	3	0	0
C17ME34.3	CO3	3	3	1	0	0	1	1	1	0	0	0	1	3	0	0
C17ME34.4	CO4	3	3	2	0	0	1	1	1	0	0	0	1	3	0	0
C17ME34.5	CO5	3	3	2	0	0	1	1	1	0	0	0	1	3	0	0
CO - PO LEVEL		3.0	3.0	1.6	0.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0	1.0	3.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	33	64.71%	71%	70%
CO2	21	41.18%	71%	65%
CO3	18	34.62%	71%	64%
CO4	21	39.62%	71%	65%
CO5	22	43.14%	71%	66%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	70%	2	81.1%	3	71%	2
CO2	65%	2	79.7%	3	67%	2
CO3	64%	2	84.2%	3	66%	2
CO4	65%	2	82.4%	3	67%	2
CO5	66%	2	81.5%	3	67%	2

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME34.1	CO1	1.94	1.94	1.29	0.00	0.00	0.65	0.65	0.65	0.00	0.00	0.00	0.65	1.94	0.00	0.00
C17ME34.2	CO2	1.24	1.24	0.41	0.00	0.00	0.41	0.41	0.41	0.00	0.00	0.00	0.41	1.24	0.00	0.00
C17ME34.3	CO3	1.04	1.04	0.35	0.00	0.00	0.35	0.35	0.35	0.00	0.00	0.00	0.35	1.04	0.00	0.00
C17ME34.4	CO4	1.19	1.19	0.79	0.00	0.00	0.40	0.40	0.40	0.00	0.00	0.00	0.40	1.19	0.00	0.00
C17ME34.5	CO5	1.29	1.29	0.86	0.00	0.00	0.43	0.43	0.43	0.00	0.00	0.00	0.43	1.29	0.00	0.00
DIRECT ATTAINMENT		1.34	1.34	0.74	0.00	0.00	0.45	0.45	0.45	0.00	0.00	0.00	0.45	1.34	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.14	2.14	1.14	0.00	0.00	0.71	0.71	0.71	0.00	0.00	0.00	0.71	2.14	0.00	0.00
ASSIGNMENT AND QUIZ	0.52	0.52	0.28	0.00	0.00	0.17	0.17	0.17	0.00	0.00	0.00	0.17	0.52	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	1.07	1.07	0.59	0.00	0.00	0.36	0.36	0.36	0.00	0.00	0.00	0.36	1.07	0.00	0.00
FINAL DIRECT ATTAINMENT	2.03	2.03	1.09	0.00	0.00	0.68	0.68	0.68	0.00	0.00	0.00	0.68	2.03	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.03	2.03	1.09	0.00	0.00	0.68	0.68	0.68	0.00	0.00	0.00	0.68	2.03	0.00	0.00
COURSE EXIT SURVEY	2.45	2.45	1.31	0.00	0.00	0.82	0.82	0.82	0.00	0.00	0.00	0.82	2.45	0.00	0.00
FINAL ATTAINMENT	2.07	2.07	1.11	0.00	0.00	0.69	0.69	0.69	0.00	0.00	0.00	0.69	2.07	0.00	0.00
% OF Attainment	69.0	69.0	69.3	0.0	0.0	69.0	69.0	69.0	0.0	0.0	0.0	69.0	69.0	0.0	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	CK

BATCH	2018 -2019
SESSION	August 2018 To December 2018
SUBJECT	Mechanics of Materials
SEMESTER	3B
SUB CODE	17ME34

CLASS STRENGTH	56
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand simple, compound, thermal stresses and strains their relations, Poisson's ratio, Hooke's law, mechanical properties including elastic constants and their relations and to determine stresses, strains and deformations in bars with varying circular and rectangular cross sections subjected to normal and temperature loads.
CO2	Determine plane stress, principal stress, maximum shear stress and their orientations using analytical method and Mohr's circle and also stress distribution in thick and thin cylinders.
CO3	Draw SFD and BMD for different beams including cantilever beams, simply supported beams and overhanging beams subjected to UDL, UVL, Point loads and couples and to determine dimensions, bending stress, shear stress and its distribution in beams of circular, rectangular, symmetrical I and T sections subjected to point loads and UDL.
CO4	Determine the dimensions of shafts based on tensional strength, rigidity and flexibility and also elastic stability of columns using Rankin's and Euler's theory.
CO5	Explain the theories of failure and to determine the strain energy due to normal stress, shear stress, bending and torsion.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME34.1	CO1	3	3	2	0	0	1	1	1	0	0	0	1	3	0	0
C17ME34.2	CO2	3	3	1	0	0	1	1	1	0	0	0	1	3	0	0
C17ME34.3	CO3	3	3	1	0	0	1	1	1	0	0	0	1	3	0	0
C17ME34.4	CO4	3	3	2	0	0	1	1	1	0	0	0	1	3	0	0
C17ME34.5	CO5	3	3	2	0	0	1	1	1	0	0	0	1	3	0	0
CO - PO LEVEL		3.0	3.0	1.6	0.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0	1.0	3.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	38	74.51%	80%	79%
CO2	27	52.94%	80%	75%
CO3	37	72.55%	80%	79%
CO4	41	80.39%	80%	80%
CO5	44	86.27%	80%	81%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	79%	3	81.1%	3	79%	3
CO2	75%	2	79.7%	3	75%	3
CO3	79%	3	84.2%	3	79%	3
CO4	80%	3	82.4%	3	81%	3
CO5	81%	3	81.5%	3	81%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME34.1	CO1	2.24	2.24	1.49	0.00	0.00	0.75	0.75	0.75	0.00	0.00	0.00	0.75	2.24	0.00	0.00
C17ME34.2	CO2	1.59	1.59	0.53	0.00	0.00	0.53	0.53	0.53	0.00	0.00	0.00	0.53	1.59	0.00	0.00
C17ME34.3	CO3	2.18	2.18	0.73	0.00	0.00	0.73	0.73	0.73	0.00	0.00	0.00	0.73	2.18	0.00	0.00
C17ME34.4	CO4	2.41	2.41	1.61	0.00	0.00	0.80	0.80	0.80	0.00	0.00	0.00	0.80	2.41	0.00	0.00
C17ME34.5	CO5	2.59	2.59	1.73	0.00	0.00	0.86	0.86	0.86	0.00	0.00	0.00	0.86	2.59	0.00	0.00
DIRECT ATTAINMENT		2.20	2.20	1.22	0.00	0.00	0.73	0.73	0.73	0.00	0.00	0.00	0.73	2.20	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.41	2.41	1.28	0.00	0.00	0.80	0.80	0.80	0.00	0.00	0.00	0.80	2.41	0.00	0.00
ASSIGNMENT AND QUIZ	0.55	0.55	0.29	0.00	0.00	0.18	0.18	0.18	0.00	0.00	0.00	0.18	0.55	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	1.76	1.76	0.97	0.00	0.00	0.59	0.59	0.59	0.00	0.00	0.00	0.59	1.76	0.00	0.00
FINAL DIRECT ATTAINMENT	2.39	2.39	1.28	0.00	0.00	0.80	0.80	0.80	0.00	0.00	0.00	0.80	2.39	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.39	2.39	1.28	0.00	0.00	0.80	0.80	0.80	0.00	0.00	0.00	0.80	2.39	0.00	0.00
COURSE EXIT SURVEY	2.45	2.45	1.31	0.00	0.00	0.82	0.82	0.82	0.00	0.00	0.00	0.82	2.45	0.00	0.00
FINAL ATTAINMENT	2.40	2.40	1.28	0.00	0.00	0.80	0.80	0.80	0.00	0.00	0.00	0.80	2.40	0.00	0.00
% OF Attainment	79.8	79.8	80.2	0.0	0.0	79.8	79.8	79.8	0.0	0.0	0.0	79.8	79.8	0.0	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	NSR

BATCH	2018 -2019
SESSION	August 2018 To December 2018
SUBJECT	Mechanics of Materials
SEMESTER	3C
SUB CODE	17ME34

CLASS STRENGTH	61
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand simple, compound, thermal stresses and strains their relations, Poisson's ratio, Hooke's law, mechanical properties including elastic constants and their relations and to determine stresses, strains and deformations in bars with varying circular and rectangular cross sections subjected to normal and temperature loads.
CO2	Determine plane stress, principal stress, maximum shear stress and their orientations using analytical method and Mohr's circle and also stress distribution in thick and thin cylinders.
CO3	Draw SFD and BMD for different beams including cantilever beams, simply supported beams and overhanging beams subjected to UDL, UVL, Point loads and couples and to determine dimensions, bending stress, shear stress and its distribution in beams of circular, rectangular, symmetrical I and T sections subjected to point loads and UDL.
CO4	Determine the dimensions of shafts based on tensional strength, rigidity and flexibility and also elastic stability of columns using Rankin's and Euler's theory.
CO5	Explain the theories of failure and to determine the strain energy due to normal stress, shear stress, bending and torsion.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME34.1	CO1	3	3	2	0	0	1	1	1	0	0	0	1	3	0	0
C17ME34.2	CO2	3	3	1	0	0	1	1	1	0	0	0	1	3	0	0
C17ME34.3	CO3	3	3	1	0	0	1	1	1	0	0	0	1	3	0	0
C17ME34.4	CO4	3	3	2	0	0	1	1	1	0	0	0	1	3	0	0
C17ME34.5	CO5	3	3	2	0	0	1	1	1	0	0	0	1	3	0	0
CO - PO LEVEL		3.0	3.0	1.6	0.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0	1.0	3.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct C O % Attainment
CO1	50	98.04%	46%	57%
CO2	28	54.90%	46%	48%
CO3	33	64.71%	46%	50%
CO4	35	71.43%	46%	51%
CO5	40	81.63%	46%	53%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	57%	1	81.0%	3	59%	1
CO2	48%	1	80.0%	3	51%	1
CO3	50%	1	84.0%	3	53%	1
CO4	51%	1	82.0%	3	54%	1
CO5	53%	1	82.0%	3	56%	1

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME34.1	CO1	2.94	2.94	1.96	0.00	0.00	0.98	0.98	0.98	0.00	0.00	0.00	0.98	2.94	0.00	0.00
C17ME34.2	CO2	1.65	1.65	0.55	0.00	0.00	0.55	0.55	0.55	0.00	0.00	0.00	0.55	1.65	0.00	0.00
C17ME34.3	CO3	1.94	1.94	0.65	0.00	0.00	0.65	0.65	0.65	0.00	0.00	0.00	0.65	1.94	0.00	0.00
C17ME34.4	CO4	2.14	2.14	1.43	0.00	0.00	0.71	0.71	0.71	0.00	0.00	0.00	0.71	2.14	0.00	0.00
C17ME34.5	CO5	2.45	2.45	1.63	0.00	0.00	0.82	0.82	0.82	0.00	0.00	0.00	0.82	2.45	0.00	0.00
DIRECT ATTAINMENT		2.22	2.22	1.24	0.00	0.00	0.74	0.74	0.74	0.00	0.00	0.00	0.74	2.22	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.38	1.38	0.74	0.00	0.00	0.46	0.46	0.46	0.00	0.00	0.00	0.46	1.38	0.00	0.00
ASSIGNMENT AND QUIZ	0.48	0.48	0.26	0.00	0.00	0.16	0.16	0.16	0.00	0.00	0.00	0.16	0.48	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	1.78	1.78	0.99	0.00	0.00	0.59	0.59	0.59	0.00	0.00	0.00	0.59	1.78	0.00	0.00
FINAL DIRECT ATTAINMENT	1.56	1.56	0.84	0.00	0.00	0.52	0.52	0.52	0.00	0.00	0.00	0.52	1.56	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.56	1.56	0.84	0.00	0.00	0.52	0.52	0.52	0.00	0.00	0.00	0.52	1.56	0.00	0.00
COURSE EXIT SURVEY	2.45	2.45	1.31	0.00	0.00	0.82	0.82	0.82	0.00	0.00	0.00	0.82	2.45	0.00	0.00
FINAL ATTAINMENT	1.65	1.65	0.89	0.00	0.00	0.55	0.55	0.55	0.00	0.00	0.00	0.55	1.65	0.00	0.00
% OF Attainment	55.0	55.0	55.5	0.0	0.0	55.0	55.0	55.0	0.0	0.0	0.0	55.0	55.0	0.0	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	MN

BATCH	2018 -2019
SESSION	August 2018 To December 2018
SUBJECT	METAL CASTING AND WELDING
SEMESTER	3A
SUB CODE	17ME35 A

CLASS STRENGTH	53
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	To impart knowledge to the students on the basic concepts of Manufacturing and sand Casting process
CO2	To enrich knowledge about special casting processes and principle of various melting furnaces.
CO3	To illustrate the solidification process and casting of non – ferrous metals.
CO4	To introduce the students the concepts of Conventional and special welding processes and their field of applications.
CO5	To acquire the knowledge on quality test methods conducted for casting and welded components.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME35 A.1	CO1	3	0	0	1	2	1	1	0	0	1	0	1	3	2	2
C17ME35 A.2	CO2	3	0	0	0	2	1	1	0	0	1	0	1	3	1	2
C17ME35 A.3	CO3	3	0	0	0	2	1	0	0	0	1	0	1	3	1	2
C17ME35 A.4	CO4	3	0	0	1	2	1	1	0	0	1	0	1	3	2	2
C17ME35 A.5	CO5	3	0	0	1	2	1	1	0	0	1	0	1	3	2	2
CO - PO LEVEL		3.0	0.0	0.0	1.0	2.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	3.0	1.6	2.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	36	69.23%	87%	83%
CO2	42	79.25%	87%	85%
CO3	26	49.06%	87%	79%
CO4	42	79.25%	87%	85%
CO5	35	67.31%	87%	83%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	83%	3	86.5%	3	84%	3
CO2	85%	3	86.9%	3	86%	3
CO3	79%	3	84.2%	3	80%	3
CO4	85%	3	85.1%	3	85%	3
CO5	83%	3	84.7%	3	83%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME35 A.1	CO1	2.08	0.00	0.00	0.69	1.38	0.69	0.69	0.00	0.00	0.69	0.00	0.69	2.08	1.38	1.38
C17ME35 A.2	CO2	2.38	0.00	0.00	0.00	1.58	0.79	0.79	0.00	0.00	0.79	0.00	0.79	2.38	0.79	1.58
C17ME35 A.3	CO3	1.47	0.00	0.00	0.00	0.98	0.49	0.00	0.00	0.00	0.49	0.00	0.49	1.47	0.49	0.98
C17ME35 A.4	CO4	2.38	0.00	0.00	0.79	1.58	0.79	0.79	0.00	0.00	0.79	0.00	0.79	2.38	1.58	1.58
C17ME35 A.5	CO5	2.02	0.00	0.00	0.67	1.35	0.67	0.67	0.00	0.00	0.67	0.00	0.67	2.02	1.35	1.35
DIRECT ATTAINMENT		2.06	0.00	0.00	0.72	1.38	0.69	0.74	0.00	0.00	0.69	0.00	0.69	2.06	1.12	1.38

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.61	0.00	0.00	0.87	1.74	0.87	0.87	0.00	0.00	0.87	0.00	0.87	2.61	1.39	1.74
ASSIGNMENT AND QUIZ	0.60	0.00	0.00	0.20	0.40	0.20	0.20	0.00	0.00	0.20	0.00	0.20	0.60	0.32	0.40
CONTINUOUS INTERNAL EVALUATION	1.65	0.00	0.00	0.58	1.10	0.55	0.59	0.00	0.00	0.55	0.00	0.55	1.65	0.90	1.10
FINAL DIRECT ATTAINMENT	2.54	0.00	0.00	0.85	1.69	0.85	0.85	0.00	0.00	0.85	0.00	0.85	2.54	1.36	1.69

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.54	0.00	0.00	0.85	1.69	0.85	0.85	0.00	0.00	0.85	0.00	0.85	2.54	1.36	1.69
COURSE EXIT SURVEY	2.56	0.00	0.00	0.85	1.71	0.85	0.86	0.00	0.00	0.85	0.00	0.85	2.56	1.37	1.71
FINAL ATTAINMENT	2.54	0.00	0.00	0.85	1.69	0.85	0.85	0.00	0.00	0.85	0.00	0.85	2.54	1.36	1.69
% OF Attainment	84.7	0.0	0.0	85.1	84.7	84.7	85.4	0.0	0.0	84.7	0.0	84.7	84.7	84.8	84.7

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	PR

BATCH	2018 -2019
SESSION	August 2018 To December 2018
SUBJECT	Metal Casting And Welding
SEMESTER	3 B
SUB CODE	17ME35A

CLASS STRENGTH	57
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
100%	0%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Attain thorough knowledge of various casting processes and select the appropriate process for manufacturing of the product
CO2	Acquire the knowledge of advanced casting processes commonly used in industries and gain information regarding melting of various metals.
CO3	Explain the solidification process and casting of non – ferrous metals
CO4	Understand and summarize the concept of various welding process used in manufacturing
CO5	Demonstrate fundamental skills on metallurgical aspects in welding and inspection methods for the quality assurance of components made upon casting and joining process.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME35A.1	CO1	3	0	0	1	2	1	1	0	0	1	0	1	3	2	2
C17ME35A.2	CO2	3	0	0	0	2	1	1	0	0	1	0	1	3	1	2
C17ME35A.3	CO3	3	0	0	1	2	1	0	0	0	1	0	1	3	1	2
C17ME35A.4	CO4	3	0	0	1	2	2	1	0	0	1	0	1	3	2	2
C17ME35A.5	CO5	3	0	0	1	2	2	1	0	0	1	0	1	3	2	2
CO - PO LEVEL		3.0	0.0	0.0	1.0	2.0	1.4	1.0	0.0	0.0	1.0	0.0	1.0	3.0	1.6	2.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct C O % Attainment
CO1	55	96.49%	83%	85%
CO2	55	96.49%	83%	85%
CO3	55	96.49%	83%	85%
CO4	55	96.49%	83%	85%
CO5	55	96.49%	83%	85%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	85%	3	86.5%	3	85%	3
CO2	85%	3	86.9%	3	85%	3
CO3	85%	3	84.2%	3	85%	3
CO4	85%	3	85.1%	3	85%	3
CO5	85%	3	84.7%	3	85%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME35A.1	CO1	2.89	0.00	0.00	0.96	1.93	0.96	0.96	0.00	0.00	0.96	0.00	0.96	2.89	1.93	1.93
C17ME35A.2	CO2	2.89	0.00	0.00	0.00	1.93	0.96	0.96	0.00	0.00	0.96	0.00	0.96	2.89	0.96	1.93
C17ME35A.3	CO3	2.89	0.00	0.00	0.96	1.93	0.96	0.00	0.00	0.00	0.96	0.00	0.96	2.89	0.96	1.93
C17ME35A.4	CO4	2.89	0.00	0.00	0.96	1.93	1.93	0.96	0.00	0.00	0.96	0.00	0.96	2.89	1.93	1.93
C17ME35A.5	CO5	2.89	0.00	0.00	0.96	1.93	1.93	0.96	0.00	0.00	0.96	0.00	0.96	2.89	1.93	1.93
DIRECT ATTAINMENT		2.89	0.00	0.00	0.96	1.93	1.35	0.96	0.00	0.00	0.96	0.00	0.96	2.89	1.54	1.93

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.48	0.00	0.00	0.83	1.65	1.16	0.83	0.00	0.00	0.83	0.00	0.83	2.48	1.32	1.65
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	2.89	0.00	0.00	0.96	1.93	1.35	0.96	0.00	0.00	0.96	0.00	0.96	2.89	1.54	1.93
FINAL DIRECT ATTAINMENT	2.56	0.00	0.00	0.85	1.71	1.19	0.85	0.00	0.00	0.85	0.00	0.85	2.56	1.37	1.71

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.56	0.00	0.00	0.85	1.71	1.19	0.85	0.00	0.00	0.85	0.00	0.85	2.56	1.37	1.71
COURSE EXIT SURVEY	2.56	0.00	0.00	0.85	1.71	1.19	0.86	0.00	0.00	0.85	0.00	0.85	2.56	1.37	1.71
FINAL ATTAINMENT	2.56	0.00	0.00	0.85	1.71	1.19	0.85	0.00	0.00	0.85	0.00	0.85	2.56	1.37	1.71
% OF Attainment	85.3	0.0	0.0	85.3	85.3	85.3	85.4	0.0	0.0	85.3	0.0	85.3	85.3	85.3	85.3

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	Dr. KGB

BATCH	2018 -2019
SESSION	August 2018 To December 2018
SUBJECT	METAL CASTING AND WELDING
SEMESTER	3C
SUB CODE	17ME35 A

CLASS STRENGTH	59
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	To impart knowledge to the students on the basic concepts of Manufacturing and sand Casting process
CO2	To enrich knowledge about special casting processes and principle of various melting furnaces.
CO3	To illustrate the solidification process and casting of non – ferrous metals.
CO4	To introduce the students the concepts of Conventional and special welding processes and their field of applications.
CO5	To acquire the knowledge on quality test methods conducted for casting and welded components.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME35 A.1	CO1	3	0	0	1	2	1	1	0	0	1	0	1	3	2	2
C17ME35 A.2	CO2	3	0	0	0	2	1	1	0	0	1	0	1	3	1	2
C17ME35 A.3	CO3	3	0	0	0	2	1	0	0	0	1	0	1	3	1	2
C17ME35 A.4	CO4	3	0	0	1	2	1	1	0	0	1	0	1	3	2	2
C17ME35 A.5	CO5	3	0	0	1	2	1	1	0	0	1	0	1	3	2	2
CO - PO LEVEL		3.0	0.0	0.0	1.0	2.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	3.0	1.6	2.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	55	94.83%	76%	80%
CO2	56	98.25%	76%	81%
CO3	53	92.98%	76%	80%
CO4	54	93.10%	76%	80%
CO5	46	82.14%	76%	78%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	80%	3	86.5%	3	81%	3
CO2	81%	3	86.9%	3	81%	3
CO3	80%	3	84.2%	3	80%	3
CO4	80%	3	85.1%	3	80%	3
CO5	78%	3	84.7%	3	78%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME35 A.1	CO1	2.84	0.00	0.00	0.95	1.90	0.95	0.95	0.00	0.00	0.95	0.00	0.95	2.84	1.90	1.90
C17ME35 A.2	CO2	2.95	0.00	0.00	0.00	1.96	0.98	0.98	0.00	0.00	0.98	0.00	0.98	2.95	0.98	1.96
C17ME35 A.3	CO3	2.79	0.00	0.00	0.00	1.86	0.93	0.00	0.00	0.00	0.93	0.00	0.93	2.79	0.93	1.86
C17ME35 A.4	CO4	2.79	0.00	0.00	0.93	1.86	0.93	0.93	0.00	0.00	0.93	0.00	0.93	2.79	1.86	1.86
C17ME35 A.5	CO5	2.46	0.00	0.00	0.82	1.64	0.82	0.82	0.00	0.00	0.82	0.00	0.82	2.46	1.64	1.64
DIRECT ATTAINMENT		2.77	0.00	0.00	0.90	1.85	0.92	0.92	0.00	0.00	0.92	0.00	0.92	2.77	1.46	1.85

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.29	0.00	0.00	0.76	1.53	0.76	0.76	0.00	0.00	0.76	0.00	0.76	2.29	1.22	1.53
ASSIGNMENT AND QUIZ	0.59	0.00	0.00	0.20	0.39	0.20	0.20	0.00	0.00	0.20	0.00	0.20	0.59	0.31	0.39
CONTINUOUS INTERNAL EVALUATION	2.21	0.00	0.00	0.72	1.48	0.74	0.74	0.00	0.00	0.74	0.00	0.74	2.21	1.17	1.48
FINAL DIRECT ATTAINMENT	2.39	0.00	0.00	0.79	1.59	0.80	0.80	0.00	0.00	0.80	0.00	0.80	2.39	1.27	1.59

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.39	0.00	0.00	0.79	1.59	0.80	0.80	0.00	0.00	0.80	0.00	0.80	2.39	1.27	1.59
COURSE EXIT SURVEY	2.56	0.00	0.00	0.85	1.71	0.85	0.86	0.00	0.00	0.85	0.00	0.85	2.56	1.37	1.71
FINAL ATTAINMENT	2.41	0.00	0.00	0.80	1.61	0.80	0.80	0.00	0.00	0.80	0.00	0.80	2.41	1.28	1.61
% OF Attainment	80.3	0.0	0.0	80.0	80.3	80.3	80.3	0.0	0.0	80.3	0.0	80.3	80.3	80.2	80.3

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	DrTKC

BATCH	2018-2019
SESSION	AUG 2018 To DEC 2018
SUBJECT	CAMD Lab
SEMESTER	3
SUB CODE	17MEA306

CLASS STRENGTH	169
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
100%	0%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand and draw the section of solids and conversion of isometric views of machine parts in to orthographic views
CO2	Able to understand and draw the sectional views of threads of ISO Metric,BSW,Square and Acme threads in 2D
CO3	Understand and draw the types of Keys as per the ISO standards in 2D Understand and draw single and double riveted joints
CO4	Able to understand and draw cotter and knuckle joint for two rods in 2D and split muff, protected type flanged, pin type flexible, Oldham's and universal couplings in 2D
CO5	Analyse, understand and draw assemblies from the part drawings with limits ,fits and tolerance given for Plummer block, Ram bottom safety valve, I.C. Engine connecting rod, Screw Jack, Tailstock of lathe, Machine Vice and Lathe square tool post in 2D and 3D

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MEA306.1	CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEA306.2	CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEA306.3	CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEA306.4	CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEA306.5	CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO - PO LEVEL		2.0	3.0	3.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	2.0	1.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	163	97.60%	85%	88%
CO2	163	97.60%	85%	88%
CO3	163	97.60%	85%	88%
CO4	163	97.60%	85%	88%
CO5	163	97.60%	85%	88%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	88%	3	86.5%	3	88%	3
CO2	88%	3	86.0%	3	88%	3
CO3	88%	3	86.8%	3	88%	3
CO4	88%	3	86.5%	3	88%	3
CO5	88%	3	86.5%	3	88%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MEA306.1	CO1	1.95	2.93	2.93	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.95	0.98	0.00	0.00
C17MEA306.2	CO2	1.95	2.93	2.93	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.95	0.98	0.00	0.00
C17MEA306.3	CO3	1.95	2.93	2.93	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.95	0.98	0.00	0.00
C17MEA306.4	CO4	1.95	2.93	2.93	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.95	0.98	0.00	0.00
C17MEA306.5	CO5	1.95	2.93	2.93	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.95	0.98	0.00	0.00
DIRECT ATTAINMENT		1.95	2.93	2.93	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.95	0.98	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.70	2.56	2.56	0.00	0.00	0.00	0.00	0.85	0.00	0.85	0.00	1.70	0.85	0.00	0.00
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	1.95	2.93	2.93	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.95	0.98	0.00	0.00
FINAL DIRECT ATTAINMENT	1.75	2.63	2.63	0.00	0.00	0.00	0.00	0.88	0.00	0.88	0.00	1.75	0.88	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.75	2.63	2.63	0.00	0.00	0.00	0.00	0.88	0.00	0.88	0.00	1.75	0.88	0.00	0.00
COURSE EXIT SURVEY	1.73	2.59	2.59	0.00	0.00	0.00	0.00	0.86	0.00	0.86	0.00	1.73	0.86	0.00	0.00
FINAL ATTAINMENT	1.75	2.63	2.63	0.00	0.00	0.00	0.00	0.88	0.00	0.88	0.00	1.75	0.88	0.00	0.00
% OF Attainment	87.6	87.6	87.6	0.0	0.0	0.0	0.0	87.6	0.0	87.6	0.0	87.6	87.6	0.0	0.0

17ME41-MAT4-ABC

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

ESTD : 2001 An Institution with a Difference

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2017-18
SESSION	FEB-JUNE2019
SUBJECT	Engineering Mathematics -IV
SEMESTER	4
SUB CODE	15MAT41

CLASS STRENGTH	162
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage	
Tests IA	Quiz + Assign
100%	0%

CO PO Mapping : At the end of the course the student will be able to	
CO1	Apply complex numbers to determine continuity/ differentiability/ analiticity of a function.
CO2	Identify the transformation and evaluate a contour intergral using Cauchy's integral formula.
CO3	Classify the random variables to determine the appropriate probability distributions
CO4	Use correlation and regression analysis to fit a suitable mathematical model for the statistical data
CO5	Detremine the joint probability distribution,its mean, variance and covariance.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C15MAT41.1	CO1	3	3										2	3	2			
C15MAT41.2	CO2	3	3	2	1								2	3	3			
C15MAT41.3	CO3	2	3	3	2								2	3	3			
C15MAT41.4	CO4	2	3	3	2								2	3	3			
C15MAT41.5	CO5		3	3	3								2	3	3			
CO - PO LEVEL		2.5	3.0	2.8	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	3.0	2.8	0.0		

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE	
3	Substantially related
2	Moderately related
1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	108	67%
CO2	108	67%
CO3	108	67%
CO4	108	67%
CO5	108	67%

Targets for SEE			Targets for InA		
ABOVE	60%	3	75%	3	
ABOVE	50%	2	60%	2	
ABOVE	45%	1	45%	1	

COURSE OUTCOMES	CO ATTAINMENT LEVEL						INDIRECT		TA	
	IA		SEE		FINAL					
CO1	67%	2	72%	3	71%	2.8	80%	3	72%	3
CO2	67%	2	72%	3	71%	2.8	77%	3	72%	3
CO3	67%	2	72%	3	71%	2.8	74%	2	71%	3
CO4	67%	2	72%	3	71%	2.8	74%	2	71%	3
CO5	67%	2	72%	3	71%	2.8	78%	3	72%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C15MAT41.1	CO1	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	2.00	1.33	0.00		
C15MAT41.2	CO2	2.00	2.00	1.33	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	2.00	2.00	0.00		
C15MAT41.3	CO3	1.33	2.00	2.00	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	2.00	2.00	0.00		
C15MAT41.4	CO4	1.33	2.00	2.00	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	2.00	2.00	0.00		
C15MAT41.5	CO5	0.00	2.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	2.00	2.00	0.00		
DIRECT ATTAINMENT		1.67	2.00	1.83	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	2.00	1.87	0.00		

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
SEMESTER END EXAMINATION	1.81	2.17	1.99	1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.44	2.17	2.02	0.00		
ASSIGNMENT AND QUIZ\	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
CONTINUOUS INTERNAL EVALUATION	1.67	2.00	1.83	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	2.00	1.87	0.00		
FINAL DIRECT ATTAINMENT	1.78	2.13	1.96	1.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42	2.13	1.99	0.00		

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
FINAL DIRECT ATTAINMENT	1.78	2.13	1.96	1.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42	2.13	1.99	0.00		
PROGRAM EXIT SURVEY	1.93	2.31	2.09	1.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.54	2.31	2.15	0.00		
FINAL ATTAINMENT	1.79	2.15	1.97	1.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.43	2.15	2.01	0.00		

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	NCM

BATCH	2018 -2019
SESSION	January 2019 To May 2019
SUBJECT	Kinematics of Machines
SEMESTER	4A
SUB CODE	17ME42

CLASS STRENGTH	54
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Identify mechanisms with basic understanding of motion.
CO2	Comprehend motion analysis and Carry out motion analysis of planar mechanisms by graphical method.
CO3	Comprehend motion analysis and Carry out motion analysis of planar mechanisms by analytical method
CO4	Comprehend motion analysis and Carry out motion analysis of gears and gear trains.
CO5	Comprehend motion analysis and Carry out motion analysis of cams

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME42.1	CO1	1	1	0	0	0	1	2	1	0	1	0	2	1	0	2
C17ME42.2	CO2	3	3	2	0	0	0	2	1	0	1	0	1	1	0	2
C17ME42.3	CO3	2	2	0	0	0	2	0	1	0	1	0	2	1	0	2
C17ME42.4	CO4	2	1	0	0	0	2	0	1	0	1	0	1	1	0	2
C17ME42.5	CO5	2	1	0	0	0	0	0	1	0	1	0	1	1	0	2
CO - PO LEVEL		2.0	1.6	2.0	0.0	0.0	1.7	2.0	1.0	0.0	1.0	0.0	1.4	1.0	0.0	2.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	47	90.38%	59%	66%
CO2	42	79.25%	59%	63%
CO3	17	60.71%	59%	60%
CO4	38	73.08%	59%	62%
CO5	38	77.55%	59%	63%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	66%	2	82.7%	3	67%	2
CO2	63%	2	80.4%	3	65%	2
CO3	60%	1	79.5%	3	62%	2
CO4	62%	2	79.0%	3	64%	2
CO5	63%	2	80.4%	3	65%	2

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME42.1	CO1	0.90	0.90	0.00	0.00	0.00	0.90	1.81	0.90	0.00	0.90	0.00	1.81	0.90	0.00	1.81
C17ME42.2	CO2	2.38	2.38	1.58	0.00	0.00	0.00	1.58	0.79	0.00	0.79	0.00	0.79	0.79	0.00	1.58
C17ME42.3	CO3	1.21	1.21	0.00	0.00	0.00	1.21	0.00	0.61	0.00	0.61	0.00	1.21	0.61	0.00	1.21
C17ME42.4	CO4	1.46	0.73	0.00	0.00	0.00	1.46	0.00	0.73	0.00	0.73	0.00	0.73	0.73	0.00	1.46
C17ME42.5	CO5	1.55	0.78	0.00	0.00	0.00	0.00	0.00	0.78	0.00	0.78	0.00	0.78	0.78	0.00	1.55
DIRECT ATTAINMENT		1.50	1.20	1.58	0.00	0.00	1.19	1.70	0.76	0.00	0.76	0.00	1.06	0.76	0.00	1.52

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.19	0.95	1.19	0.00	0.00	0.99	1.19	0.59	0.00	0.59	0.00	0.83	0.59	0.00	1.19
ASSIGNMENT AND QUIZ	0.36	0.29	0.36	0.00	0.00	0.30	0.36	0.18	0.00	0.18	0.00	0.25	0.18	0.00	0.36
CONTINUOUS INTERNAL EVALUATION	1.20	0.96	1.27	0.00	0.00	0.95	1.36	0.61	0.00	0.61	0.00	0.85	0.61	0.00	1.22
FINAL DIRECT ATTAINMENT	1.26	1.01	1.28	0.00	0.00	1.04	1.29	0.63	0.00	0.63	0.00	0.89	0.63	0.00	1.27

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.26	1.01	1.28	0.00	0.00	1.04	1.29	0.63	0.00	0.63	0.00	0.89	0.63	0.00	1.27
COURSE EXIT SURVEY	1.60	1.28	1.61	0.00	0.00	1.33	1.63	0.80	0.00	0.80	0.00	1.13	0.80	0.00	1.61
FINAL ATTAINMENT	1.30	1.04	1.31	0.00	0.00	1.07	1.33	0.65	0.00	0.65	0.00	0.91	0.65	0.00	1.30
% OF Attainment	64.8	64.8	65.5	0.0	0.0	64.3	66.4	65.0	0.0	65.0	0.0	65.0	65.0	0.0	65.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	DK

BATCH	2018 -2019
SESSION	January 2019 To May 2019
SUBJECT	Kinematics of Machines
SEMESTER	4A
SUB CODE	17ME42

CLASS STRENGTH	57
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Identify mechanisms with basic understanding of motion.
CO2	Comprehend motion analysis and Carry out motion analysis of planar mechanisms by graphical method.
CO3	Comprehend motion analysis and Carry out motion analysis of planar mechanisms by analytical method
CO4	Comprehend motion analysis and Carry out motion analysis of gears and gear trains.
CO5	Comprehend motion analysis and Carry out motion analysis of cams

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME42.1	CO1	1	1	0	0	0	1	2	1	0	1	0	2	1	0	2
C17ME42.2	CO2	3	3	2	0	0	0	2	1	0	1	0	1	1	0	2
C17ME42.3	CO3	2	2	0	0	0	2	0	1	0	1	0	2	1	0	2
C17ME42.4	CO4	2	1	0	0	0	2	0	1	0	1	0	1	1	0	2
C17ME42.5	CO5	2	1	0	0	0	0	0	1	0	1	0	1	1	0	2
CO - PO LEVEL		2.0	1.6	2.0	0.0	0.0	1.7	2.0	1.0	0.0	1.0	0.0	1.4	1.0	0.0	2.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	51	91.07%	65%	70%
CO2	51	91.07%	65%	70%
CO3	35	67.31%	65%	65%
CO4	36	63.16%	65%	65%
CO5	44	77.19%	65%	67%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	70%	2	83.0%	3	71%	2
CO2	70%	2	80.0%	3	71%	2
CO3	65%	2	80.0%	3	67%	2
CO4	65%	2	79.0%	3	66%	2
CO5	67%	2	80.0%	3	69%	2

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME42.1	CO1	0.91	0.91	0.00	0.00	0.00	0.91	1.82	0.91	0.00	0.91	0.00	1.82	0.91	0.00	1.82
C17ME42.2	CO2	2.73	2.73	1.82	0.00	0.00	0.00	1.82	0.91	0.00	0.91	0.00	0.91	0.91	0.00	1.82
C17ME42.3	CO3	1.35	1.35	0.00	0.00	0.00	1.35	0.00	0.67	0.00	0.67	0.00	1.35	0.67	0.00	1.35
C17ME42.4	CO4	1.26	0.63	0.00	0.00	0.00	1.26	0.00	0.63	0.00	0.63	0.00	0.63	0.63	0.00	1.26
C17ME42.5	CO5	1.54	0.77	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.77	0.00	0.77	0.77	0.00	1.54
DIRECT ATTAINMENT		1.56	1.28	1.82	0.00	0.00	1.17	1.82	0.78	0.00	0.78	0.00	1.10	0.78	0.00	1.56

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.30	1.04	1.30	0.00	0.00	1.08	1.30	0.65	0.00	0.65	0.00	0.91	0.65	0.00	1.30
ASSIGNMENT AND QUIZ	0.38	0.30	0.38	0.00	0.00	0.32	0.38	0.19	0.00	0.19	0.00	0.27	0.19	0.00	0.38
CONTINUOUS INTERNAL EVALUATION	1.25	1.02	1.46	0.00	0.00	0.94	1.46	0.62	0.00	0.62	0.00	0.88	0.62	0.00	1.25
FINAL DIRECT ATTAINMENT	1.36	1.10	1.41	0.00	0.00	1.12	1.41	0.68	0.00	0.68	0.00	0.96	0.68	0.00	1.36

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.36	1.10	1.41	0.00	0.00	1.12	1.41	0.68	0.00	0.68	0.00	0.96	0.68	0.00	1.36
COURSE EXIT SURVEY	1.60	1.28	1.60	0.00	0.00	1.34	1.63	0.80	0.00	0.80	0.00	1.13	0.80	0.00	1.61
FINAL ATTAINMENT	1.39	1.12	1.43	0.00	0.00	1.14	1.43	0.69	0.00	0.69	0.00	0.97	0.69	0.00	1.39
% OF Attainment	*69.4*	*69.7*	*71.3*	*0.0*	*0.0*	*68.3*	*71.5*	*69.5*	*0.0*	*69.5*	*0.0*	*69.5*	*69.5*	*0.0*	*69.5*

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	LBW

BATCH	2018 -2019
SESSION	January 2019 To May 2019
SUBJECT	Kinematics of Machines
SEMESTER	4A
SUB CODE	17ME42

CLASS STRENGTH	55
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Identify mechanisms with basic understanding of motion.
CO2	Comprehend motion analysis and Carry out motion analysis of planar mechanisms by graphical method.
CO3	Comprehend motion analysis and Carry out motion analysis of planar mechanisms by analytical method
CO4	Comprehend motion analysis and Carry out motion analysis of gears and gear trains.
CO5	Comprehend motion analysis and Carry out motion analysis of cams

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME42.1	CO1	1	1	0	0	0	1	2	1	0	1	0	2	1	0	2
C17ME42.2	CO2	3	3	2	0	0	0	2	1	0	1	0	1	1	0	2
C17ME42.3	CO3	2	2	0	0	0	2	0	1	0	1	0	2	1	0	2
C17ME42.4	CO4	2	1	0	0	0	2	0	1	0	1	0	1	1	0	2
C17ME42.5	CO5	2	1	0	0	0	0	0	1	0	1	0	1	1	0	2
CO - PO LEVEL		2.0	1.6	2.0	0.0	0.0	1.7	2.0	1.0	0.0	1.0	0.0	1.4	1.0	0.0	2.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	42	76.36%	58%	62%
CO2	28	53.85%	58%	57%
CO3	26	68.42%	58%	60%
CO4	29	58.00%	58%	58%
CO5	47	92.16%	58%	65%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	62%	2	82.7%	3	64%	2
CO2	57%	1	80.4%	3	60%	1
CO3	60%	2	79.5%	3	62%	2
CO4	58%	1	79.0%	3	60%	2
CO5	65%	2	80.4%	3	67%	2

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME42.1	CO1	0.76	0.76	0.00	0.00	0.00	0.76	1.53	0.76	0.00	0.76	0.00	1.53	0.76	0.00	1.53
C17ME42.2	CO2	1.62	1.62	1.08	0.00	0.00	0.00	1.08	0.54	0.00	0.54	0.00	0.54	0.54	0.00	1.08
C17ME42.3	CO3	1.37	1.37	0.00	0.00	0.00	1.37	0.00	0.68	0.00	0.68	0.00	1.37	0.68	0.00	1.37
C17ME42.4	CO4	1.16	0.58	0.00	0.00	0.00	1.16	0.00	0.58	0.00	0.58	0.00	0.58	0.58	0.00	1.16
C17ME42.5	CO5	1.84	0.92	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.92	0.00	0.92	0.92	0.00	1.84
DIRECT ATTAINMENT		1.35	1.05	1.08	0.00	0.00	1.10	1.30	0.70	0.00	0.70	0.00	0.99	0.70	0.00	1.40

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.17	0.93	1.17	0.00	0.00	0.97	1.17	0.58	0.00	0.58	0.00	0.82	0.58	0.00	1.17
ASSIGNMENT AND QUIZ	0.35	0.28	0.35	0.00	0.00	0.29	0.35	0.17	0.00	0.17	0.00	0.24	0.17	0.00	0.35
CONTINUOUS INTERNAL EVALUATION	1.08	0.84	0.86	0.00	0.00	0.88	1.04	0.56	0.00	0.56	0.00	0.79	0.56	0.00	1.12
FINAL DIRECT ATTAINMENT	1.22	0.97	1.17	0.00	0.00	1.01	1.21	0.61	0.00	0.61	0.00	0.86	0.61	0.00	1.23

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.22	0.97	1.17	0.00	0.00	1.01	1.21	0.61	0.00	0.61	0.00	0.86	0.61	0.00	1.23
COURSE EXIT SURVEY	1.60	1.28	1.61	0.00	0.00	1.33	1.63	0.80	0.00	0.80	0.00	1.13	0.80	0.00	1.61
FINAL ATTAINMENT	1.26	1.00	1.22	0.00	0.00	1.04	1.25	0.63	0.00	0.63	0.00	0.89	0.63	0.00	1.26
% OF Attainment	62.8	62.6	60.9	0.0	0.0	62.6	62.6	63.2	0.0	63.2	0.0	63.3	63.2	0.0	63.2

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

ESTD : 2001 An Institution with a Difference

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2015 - 19	CLASS STRENGTH	53		
SESSION	Feb - Jun 2019	SET TARGET FOR INTERNAL ASSESSMENT (%)	60	Internal Marks Weightage	
SUBJECT	APPLIEDTHERMODYNAMICS	SET TARGET FOR UNIVERSITY EXAMINATION (%)	45	Tests IA	Quiz + Assign
SEMESTER	4	WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	60%	80%	20%
SUB CODE	18ME33	WEIGHTAGE FOR SEMESTER END EXAMINATION	45%		

CO PO Mapping	
CO1	Apply thermodynamic concepts to analyze the performance of gas power cycles and jet propulsion and evaluate performance of Brayton cycle
CO2	Apply thermodynamic concepts to analyze the performance of vapour power cycles.
CO3	Apply thermodynamic concepts to analyze the performance of IC Engines and combustion engg
CO4	Explore the principles, applications and COP of refrigeration systems and Air conditioners
CO5	Apply Thermodynamic concepts to determine performance parameters of Air compressors and Steam nozzles

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C18ME33.1	CO1	3	2	2					2		1			1		
C18ME33.2	CO2	3	2	2					2		1			1		
C18ME33.3	CO3	3	2	2					2		1			1		
C18ME33.4	CO4	3	2	2					2		1			1		
C18ME33.5	CO5	3	2	2					2		1			1		
CO - PO LEVEL		3.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	18	36.73%
CO2	33	64.71%
CO3	14	36.84%
CO4	30	60.00%
CO5	29	59.18%

Targets for SEE			Targets for InA		
ABOVE	75%	3	75%	3	
ABOVE	60%	2	60%	2	
ABOVE	45%	1	45%	1	

COURSE OUTCOMES	ATTAINMENT LEVEL IA		SEE		FINAL		Indirect Attainment		Final
CO1	36.73 %	0	19%	0	22 %	0	73 %	2	0
CO2	64.71 %	2	19%	0	28 %	0	72 %	2	0
CO3	36.84 %	0	19%	0	22 %	0	76 %	3	0
CO4	60.00 %	2	19%	0	27 %	0	72 %	2	0
CO5	59.18 %	1	19%	0	27 %	0	77 %	3	0
CO6	0.00%	0	0%	0	0%	0		0	0

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C18ME33.1	CO1	1.10	0.73	0.73	0.00	0.00	0.00	0.00	0.73	0.00	0.37	0.00	0.00	0.37	0.00	0.00
C18ME33.2	CO2	1.94	1.29	1.29	0.00	0.00	0.00	0.00	1.29	0.00	0.65	0.00	0.00	0.65	0.00	0.00
C18ME33.3	CO3	1.11	0.74	0.74	0.00	0.00	0.00	0.00	0.74	0.00	0.37	0.00	0.00	0.37	0.00	0.00
C18ME33.4	CO4	1.80	1.20	1.20	0.00	0.00	0.00	0.00	1.20	0.00	0.60	0.00	0.00	0.60	0.00	0.00
C18ME33.5	CO5	1.78	1.18	1.18	0.00	0.00	0.00	0.00	1.18	0.00	0.59	0.00	0.00	0.59	0.00	0.00
DIRECT ATTAINMENT		1.54	1.03	1.03	0.00	0.00	0.00	0.00	1.03	0.00	0.51	0.00	0.00	0.51	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	0.57	0.38	0.38	0.00	0.00	0.00	0.00	0.38	0.00	0.19	0.00	0.00	0.19	0.00	0.00
ASSIGNMENT AND QUIZ	0.59	0.39	0.39	0.00	0.00	0.00	0.00	0.39	0.00	0.20	0.00	0.00	0.20	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	1.24	0.82	0.82	0.00	0.00	0.00	0.00	0.82	0.00	0.41	0.00	0.00	0.41	0.00	0.00
FINAL DIRECT ATTAINMENT	1.35	0.90	0.90	0.00	0.00	0.00	0.00	0.90	0.00	0.45	0.00	0.00	0.45	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.35	0.90	0.90	0.00	0.00	0.00	0.00	0.90	0.00	0.45	0.00	0.00	0.45	0.00	0.00
PROGRAM EXIT SURVEY	2.22	1.48	1.48	0.00	0.00	0.00	0.00	1.48	0.00	0.74	0.00	0.00	0.74	0.00	0.00
FINAL ATTAINMENT	1.44	0.96	0.96	0.00	0.00	0.00	0.00	0.96	0.00	0.48	0.00	0.00	0.48	0.00	0.00

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

ESTD : 2001 An Institution with a Difference

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2015 - 19
SESSION	Feb - Jun 2019
SUBJECT	APPLIEDTHERMODYNAMICS
SEMESTER	4B
SUB CODE	18ME43

CLASS STRENGTH	53
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	40
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	60%
WEIGHTAGE FOR SEMESTER END EXAMINATION	45%

Internal Marks Weightage	
Tests IA	Quiz + Assign
80%	20%

CO PO Mapping

CO1	Apply thermodynamic concepts to analyze the performance of gas power cycles and jet propulsion and evaluate performance of Brayton cycle
CO2	Apply thermodynamic concepts to analyze the performance of vapour power cycles.
CO3	Apply thermodynamic concepts to analyze the performance of IC Engines and combustion engg
CO4	Explore the principles, applications and COP of refrigeration systems and Air conditioners
CO5	Apply Thermodynamic concepts to determine performance parameters of Air compressors and Steam nozzles

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C18ME43.1	CO1	3	2	2					2		1			1		
C18ME43.2	CO2	3	2	2					2		1			1		
C18ME43.3	CO3	3	2	2					2		1			1		
C18ME43.4	CO4	3	2	2					2		1			1		
C18ME43.5	CO5	3	2	2					2		1			1		
CO - PO LEVEL		3.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
3	Substantially related	
2	Moderately related	
1	Slightly related	

INTERNAL ASSESSMENT		
Target>=60		
CO1	13	26.00%
CO2	26	49.06%
CO3	5	11.11%
CO4	16	30.19%
CO5	18	34.62%

Targets for SEE			Targets for InA		
ABOVE	60%	3	75%	3	
ABOVE	50%	2	60%	2	
ABOVE	45%	1	45%	1	

COURSE OUTCOMES	ATTAINMENT LEVEL								
	IA		SEE		FINAL		Indirect Attainment		Final
CO1	26.00%	0	45%	1	41%	0	73%	2	0
CO2	49.06%	1	45%	1	46%	1	72%	2	1
CO3	11.11%	0	45%	1	38%	0	76%	3	0
CO4	30.19%	0	45%	1	42%	0	72%	2	0
CO5	34.62%	0	45%	1	43%	0	77%	3	0
CO6	0.00%	0	0%	0	0%	0		0	0

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C18ME43.1	CO1	0.78	0.52	0.52	0.00	0.00	0.00	0.00	0.52	0.00	0.26	0.00	0.00	0.26	0.00	0.00
C18ME43.2	CO2	1.47	0.98	0.98	0.00	0.00	0.00	0.00	0.98	0.00	0.49	0.00	0.00	0.49	0.00	0.00
C18ME43.3	CO3	0.33	0.22	0.22	0.00	0.00	0.00	0.00	0.22	0.00	0.11	0.00	0.00	0.11	0.00	0.00
C18ME43.4	CO4	0.91	0.60	0.60	0.00	0.00	0.00	0.00	0.60	0.00	0.30	0.00	0.00	0.30	0.00	0.00
C18ME43.5	CO5	1.04	0.69	0.69	0.00	0.00	0.00	0.00	0.69	0.00	0.35	0.00	0.00	0.35	0.00	0.00
DIRECT ATTAINMENT		0.91	0.60	0.60	0.00	0.00	0.00	0.00	0.60	0.00	0.30	0.00	0.00	0.30	0.30	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.36	0.91	0.91	0.00	0.00	0.00	0.00	0.91	0.00	0.45	0.00	0.00	0.45	0.00	0.00
ASSIGNMENT AND QUIZ	0.63	0.42	0.42	0.00	0.00	0.00	0.00	0.42	0.00	0.21	0.00	0.00	0.21	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	0.72	0.48	0.48	0.00	0.00	0.00	0.00	0.48	0.00	0.24	0.00	0.00	0.24	0.00	0.00
FINAL DIRECT ATTAINMENT	1.43	0.95	0.95	0.00	0.00	0.00	0.00	0.95	0.00	0.48	0.00	0.00	0.48	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.43	0.95	0.95	0.00	0.00	0.00	0.00	0.95	0.00	0.48	0.00	0.00	0.48	0.00	0.00
PROGRAM EXIT SURVEY	2.22	1.48	1.48	0.00	0.00	0.00	0.00	1.48	0.00	0.74	0.00	0.00	0.74	0.00	0.00
FINAL ATTAINMENT	1.51	1.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.50	0.00	0.00	0.50	0.00	0.00

17ME43-ATD-C

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2015 - 19	CLASS STRENGTH	55		
SESSION	Feb - Jun 2019	SET TARGET FOR INTERNAL ASSESSMENT (%)	60	Internal Marks Weightage	
SUBJECT	APPLIEDTHERMODYNAMICS	SET TARGET FOR UNIVERSITY EXAMINATION (%)	45	Tests IA	Quiz + Assign
SEMESTER	4	WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	60%	80%	20%
SUB CODE	18ME33	WEIGHTAGE FOR SEMESTER END EXAMINATION	45%		

CO PO Mapping	
CO1	Apply thermodynamic concepts to analyze the performance of gas power cycles and jet propulsion and evaluate performance of Brayton cycle
CO2	Apply thermodynamic concepts to analyze the performance of vapour power cycles.
CO3	Apply thermodynamic concepts to analyze the performance of IC Engines and combustion engg
CO4	Explore the principles, applications and COP of refrigeration systems and Air conditioners
CO5	Apply Thermodynamic concepts to determine performance parameters of Air compressors and Steam nozzles

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C18ME33.1	CO1	3	2	2					2		1			1		
C18ME33.2	CO2	3	2	2					2		1			1		
C18ME33.3	CO3	3	2	2					2		1			1		
C18ME33.4	CO4	3	2	2					2		1			1		
C18ME33.5	CO5	3	2	2					2		1			1		
CO - PO LEVEL		3.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	32	60.38%
CO2	50	90.91%
CO3	23	48.94%
CO4	26	49.06%
CO5	32	60.38%

Targets for SEE			Targets for InA		
ABOVE	75%	3	75%	3	
ABOVE	60%	2	60%	2	
ABOVE	45%	1	45%	1	

COURSE OUTCOMES	ATTAINMENT LEVEL IA		SEE		FINAL		Indirect Attainment		Final
CO1	60.38 %	2	20%	0	28 %	0	73 %	2	0
CO2	90.91 %	3	20%	0	34 %	0	72 %	2	0
CO3	48.94 %	0	20%	0	26 %	0	76 %	3	0
CO4	49.06 %	1	20%	0	26 %	0	72 %	2	0
CO5	60.38 %	2	20%	0	28 %	0	77 %	3	0
CO6	0.00%	0	0%	0	0%	0		0	0

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C18ME33.1	CO1	1.81	1.21	1.21	0.00	0.00	0.00	0.00	1.21	0.00	0.60	0.00	0.00	0.60	0.00	0.00
C18ME33.2	CO2	2.73	1.82	1.82	0.00	0.00	0.00	0.00	1.82	0.00	0.91	0.00	0.00	0.91	0.00	0.00
C18ME33.3	CO3	1.47	0.98	0.98	0.00	0.00	0.00	0.00	0.98	0.00	0.49	0.00	0.00	0.49	0.00	0.00
C18ME33.4	CO4	1.47	0.98	0.98	0.00	0.00	0.00	0.00	0.98	0.00	0.49	0.00	0.00	0.49	0.00	0.00
C18ME33.5	CO5	1.81	1.21	1.21	0.00	0.00	0.00	0.00	1.21	0.00	0.60	0.00	0.00	0.60	0.00	0.00
DIRECT ATTAINMENT		1.86	1.24	1.24	0.00	0.00	0.00	0.00	1.24	0.00	0.62	0.00	0.00	0.62	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	0.60	0.40	0.40	0.00	0.00	0.00	0.00	0.40	0.00	0.20	0.00	0.00	0.20	0.00	0.00
ASSIGNMENT AND QUIZ	0.51	0.34	0.34	0.00	0.00	0.00	0.00	0.34	0.00	0.17	0.00	0.00	0.17	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	1.49	0.99	0.99	0.00	0.00	0.00	0.00	0.99	0.00	0.50	0.00	0.00	0.50	0.00	0.00
FINAL DIRECT ATTAINMENT	1.47	0.98	0.98	0.00	0.00	0.00	0.00	0.98	0.00	0.49	0.00	0.00	0.49	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.47	0.98	0.98	0.00	0.00	0.00	0.00	0.98	0.00	0.49	0.00	0.00	0.49	0.00	0.00
PROGRAM EXIT SURVEY	2.22	1.48	1.48	0.00	0.00	0.00	0.00	1.48	0.00	0.74	0.00	0.00	0.74	0.00	0.00
FINAL ATTAINMENT	1.54	1.03	1.03	0.00	0.00	0.00	0.00	1.03	0.00	0.51	0.00	0.00	0.51	0.00	0.00

17ME44-FM-A

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

ESTD : 2001 An Institution with a Difference

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2018
SESSION	Aug - Dec 2018
SUBJECT	FM
SEMESTER	4
SUB CODE	18MEL44

CLASS STRENGTH	59
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage	
Tests IA	Quiz + Assign
100%	0%

CO PO Mapping : At the end of the course the student will be able to	
	Understand the properties of fluids, fluid behaviour and flotation of bodies
CO2	Comprehend various types of fluid flow, transformation of fluid energy to mechanical energy and measurement of fluid flow
CO3	Understand the basic concept of Laminar flow, turbulent flow and Energy consideration in pipe flow
CO4	Understand the concept of boundary layer, concept of lift and drag in fluid flow and apply dimensional analysis to form dimensionless numbers in terms of input output variables.
CO5	Understand the basic concept of compressible flow and CFD

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C18MEL44.1	CO1	3	3										2	2				
C18MEL44.2	CO2	3	3										2	2				
C18MEL44.3	CO3	3	3	2									2	2				
C18MEL44.4	CO4	3	3	2									2	2				
C18MEL44.5	CO5	3	2	1		1							2	2				
CO - PO LEVEL		3.0	2.8	1.7	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0		

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE	
3	Substantially related
2	Moderately related
1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	37	63%
CO2	37	63%
CO3	37	63%
CO4	37	63%
CO5	37	63%

Targets for SEE				Targets for InA	
ABOVE	60%	3		75%	3
ABOVE	50%	2		60%	2
ABOVE	45%	1		45%	1

COURSE OUTCOMES	CO ATTAINMENT LEVEL						INDIRECT		TA	
	IA		SEE		FINAL					
CO1	63%	2	54%	2	56%	2	79%	3	58%	2
CO2	63%	2	54%	2	56%	2	79%	3	58%	2
CO3	63%	2	54%	2	56%	2	84%	3	59%	2
CO4	63%	2	54%	2	56%	2	77%	3	58%	2
CO5	63%	2	54%	2	56%	2	78%	3	58%	2

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C18MEL44.1	CO1	1.88	1.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	1.25	0.00	0.00		
C18MEL44.2	CO2	1.88	1.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	1.25	0.00	0.00		
C18MEL44.3	CO3	1.88	1.88	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	1.25	0.00	0.00		
C18MEL44.4	CO4	1.88	1.88	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	1.25	0.00	0.00		
C18MEL44.5	CO5	1.88	1.25	0.63	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	1.25	1.25	0.00	0.00		
DIRECT ATTAINMENT		1.88	1.76	1.05	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	1.25	1.25	0.00	0.00		

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
SEMESTER END EXAMINATION	1.63	1.52	0.90	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00	1.08	1.08	0.00	0.00		
ASSIGNMENT AND QUIZ\	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
CONTINUOUS INTERNAL EVALUATION	1.88	1.76	1.05	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	1.25	1.25	0.00	0.00		
FINAL DIRECT ATTAINMENT	1.68	1.57	0.93	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	1.12	1.12	0.00	0.00		

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
FINAL DIRECT ATTAINMENT	1.68	1.57	0.93	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	1.12	1.12	0.00	0.00		
PROGRAM EXIT SURVEY	2.38	2.22	1.33	0.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00	1.59	1.59	0.00	0.00		
FINAL ATTAINMENT	1.75	1.63	0.97	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	1.17	1.17	0.00	0.00		

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	ANR/NMK, RR, CK

BATCH	2018-19
SESSION	Feb 2019 To May 2019
SUBJECT	Fluid Mechanis
SEMESTER	4 B,C
SUB CODE	17ME44

CLASS STRENGTH	109
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand the properties of fluids, fluid behaviour and flotation of bodies
CO2	Comprehend various types of fluid flow, transformation of fluid energy to mechanical energy and measurement of fluid flow
CO3	Understand the basic concept of Laminar flow, turbulent flow and Energy consideration in pipe flow
CO4	Understand the concept of boundary layer, concept of lift and drag in fluid flow and apply dimensional analysis to form dimensionless numbers in terms of input output variables.
CO5	Understand the basic concept of compressible flow and CFD

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME44.1	CO1	3	3	0	0	0	0	0	0	0	0	0	2	2	0	0
C17ME44.2	CO2	3	3	0	0	0	0	0	0	0	0	0	2	2	0	0
C17ME44.3	CO3	3	3	2	0	0	0	0	0	0	0	0	2	2	0	0
C17ME44.4	CO4	3	3	2	0	0	0	0	0	0	0	0	2	2	0	0
C17ME44.5	CO5	3	2	1	0	1	0	0	0	0	0	0	2	2	0	0
CO - PO LEVEL		3.0	2.8	1.7	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	79	73.15%	69%	70%
CO2	51	62.20%	69%	68%
CO3	89	80.18%	69%	71%
CO4	94	84.68%	69%	72%
CO5	86	80.37%	69%	71%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	70%	2	79.0%	3	71%	2
CO2	68%	2	78.5%	3	69%	2
CO3	71%	2	84.0%	3	73%	2
CO4	72%	2	76.7%	3	73%	2
CO5	71%	2	78.1%	3	72%	2

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME44.1	CO1	2.19	2.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.46	1.46	0.00	0.00
C17ME44.2	CO2	1.87	1.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.24	1.24	0.00	0.00
C17ME44.3	CO3	2.41	2.41	1.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.60	1.60	0.00	0.00
C17ME44.4	CO4	2.54	2.54	1.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.69	1.69	0.00	0.00
C17ME44.5	CO5	2.41	1.61	0.80	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	1.61	1.61	0.00	0.00
DIRECT ATTAINMENT		2.28	2.12	1.37	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	1.52	1.52	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.07	1.93	1.15	0.00	0.69	0.00	0.00	0.00	0.00	0.00	0.00	1.38	1.38	0.00	0.00
ASSIGNMENT AND QUIZ	0.58	0.54	0.32	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.39	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	1.83	1.70	1.09	0.00	0.64	0.00	0.00	0.00	0.00	0.00	0.00	1.22	1.22	0.00	0.00
FINAL DIRECT ATTAINMENT	2.14	2.00	1.20	0.00	0.72	0.00	0.00	0.00	0.00	0.00	0.00	1.43	1.43	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.14	2.00	1.20	0.00	0.72	0.00	0.00	0.00	0.00	0.00	0.00	1.43	1.43	0.00	0.00
COURSE EXIT SURVEY	2.38	2.22	1.33	0.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00	1.59	1.59	0.00	0.00
FINAL ATTAINMENT	2.16	2.02	1.22	0.00	0.73	0.00	0.00	0.00	0.00	0.00	0.00	1.44	1.44	0.00	0.00
% OF Attainment	72.1	72.1	73.0	0.0	72.6	0.0	0.0	0.0	0.0	0.0	0.0	72.1	72.1	0.0	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	PR

BATCH	2019
SESSION	february 2019 To May 2019
SUBJECT	Machine Tools and Operation
SEMESTER	4A
SUB CODE	17ME45B

CLASS STRENGTH	52
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	To understand the construction and specification of different machine tools
CO2	To gain knowledge pertaining to relative motion and mechanics required for various machine tools
CO3	To develop knowledge of cutting tool materials and geometry of cutting tools
CO4	To apply mechanics of machining process and effect of various parameters on economics of machining
CO5	To analyze the wear and tear of cutting tools and economics of machining process

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME45B.1	CO1	3	0	0	0	0	1	1	0	0	1	0	1	3	2	1
C17ME45B.2	CO2	3	3	0	0	0	1	1	0	0	1	0	1	3	3	1
C17ME45B.3	CO3	3	2	0	0	0	1	1	0	0	1	0	1	3	3	1
C17ME45B.4	CO4	3	2	2	0	0	1	1	0	0	1	0	1	3	3	1
C17ME45B.5	CO5	3	2	2	0	0	1	1	0	0	1	0	1	3	3	1
CO - PO LEVEL		3.0	2.3	2.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	3.0	2.8	1.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			S E E	Final Direct C O % Attainment
CO1	47	92.16%	81%	83%
CO2	45	86.54%	81%	82%
CO3	45	86.54%	81%	82%
CO4	47	94.00%	81%	84%
CO5	44	84.62%	81%	82%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	83%	3	80.1%	3	83%	3
CO2	82%	3	84.3%	3	82%	3
CO3	82%	3	81.9%	3	82%	3
CO4	84%	3	84.7%	3	84%	3
CO5	82%	3	85.7%	3	82%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME45B.1	CO1	2.76	0.00	0.00	0.00	0.00	0.92	0.92	0.00	0.00	0.92	0.00	0.92	2.76	1.84	0.92
C17ME45B.2	CO2	2.60	2.60	0.00	0.00	0.00	0.87	0.87	0.00	0.00	0.87	0.00	0.87	2.60	2.60	0.87
C17ME45B.3	CO3	2.60	1.73	0.00	0.00	0.00	0.87	0.87	0.00	0.00	0.87	0.00	0.87	2.60	2.60	0.87
C17ME45B.4	CO4	2.82	1.88	1.88	0.00	0.00	0.94	0.94	0.00	0.00	0.94	0.00	0.94	2.82	2.82	0.94
C17ME45B.5	CO5	2.54	1.69	1.69	0.00	0.00	0.85	0.85	0.00	0.00	0.85	0.00	0.85	2.54	2.54	0.85
DIRECT ATTAINMENT		2.66	1.97	1.79	0.00	0.00	0.89	0.89	0.00	0.00	0.89	0.00	0.89	2.66	2.48	0.89

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.43	1.82	1.62	0.00	0.00	0.81	0.81	0.00	0.00	0.81	0.00	0.81	2.43	2.27	0.81
ASSIGNMENT AND QUIZ	0.59	0.44	0.39	0.00	0.00	0.20	0.20	0.00	0.00	0.20	0.00	0.20	0.59	0.55	0.20
CONTINUOUS INTERNAL EVALUATION	2.13	1.58	1.43	0.00	0.00	0.71	0.71	0.00	0.00	0.71	0.00	0.71	2.13	1.98	0.71
FINAL DIRECT ATTAINMENT	2.49	1.86	1.66	0.00	0.00	0.83	0.83	0.00	0.00	0.83	0.00	0.83	2.49	2.32	0.83

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.49	1.86	1.66	0.00	0.00	0.83	0.83	0.00	0.00	0.83	0.00	0.83	2.49	2.32	0.83
COURSE EXIT SURVEY	2.50	1.89	1.70	0.00	0.00	0.83	0.83	0.00	0.00	0.83	0.00	0.83	2.50	2.34	0.83
FINAL ATTAINMENT	2.49	1.86	1.66	0.00	0.00	0.83	0.83	0.00	0.00	0.83	0.00	0.83	2.49	2.32	0.83
% OF Attainment	82.9	82.9	83.2	0.0	0.0	82.9	82.9	0.0	0.0	82.9	0.0	82.9	82.9	82.9	82.9

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	MN

BATCH	2019
SESSION	february 2019 To May 2019
SUBJECT	Machine Tools and Operation
SEMESTER	4B
SUB CODE	17ME45B

CLASS STRENGTH	57
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	To understand the construction and specification of different machine tools
CO2	To gain knowledge pertaining to relative motion and mechanics required for various machine tools
CO3	To develop knowledge of cutting tool materials and geometry of cutting tools
CO4	To apply mechanics of machining process and effect of various parameters on economics of machining
CO5	To analyze the wear and tear of cutting tools and economics of machining process

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME45B.1	CO1	3	0	0	0	0	1	1	0	0	1	0	1	3	2	1
C17ME45B.2	CO2	3	3	0	0	0	1	1	0	0	1	0	1	3	3	1
C17ME45B.3	CO3	3	2	0	0	0	1	1	0	0	1	0	1	3	3	1
C17ME45B.4	CO4	3	2	2	0	0	1	1	0	0	1	0	1	3	3	1
C17ME45B.5	CO5	3	2	2	0	0	1	1	0	0	1	0	1	3	3	1
CO - PO LEVEL		3.0	2.3	2.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	3.0	2.8	1.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			S E E	Final Direct C O % Attainment
Target>=60				
CO1	45	78.95%	84%	83%
CO2	38	66.67%	84%	81%
CO3	48	84.21%	84%	84%
CO4	50	87.72%	84%	85%
CO5	45	78.95%	84%	83%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	83%	3	80.1%	3	83%	3
CO2	81%	3	84.3%	3	81%	3
CO3	84%	3	81.9%	3	84%	3
CO4	85%	3	84.7%	3	85%	3
CO5	83%	3	85.7%	3	84%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME45B.1	CO1	2.37	0.00	0.00	0.00	0.00	0.79	0.79	0.00	0.00	0.79	0.00	0.79	2.37	1.58	0.79
C17ME45B.2	CO2	2.00	2.00	0.00	0.00	0.00	0.67	0.67	0.00	0.00	0.67	0.00	0.67	2.00	2.00	0.67
C17ME45B.3	CO3	2.53	1.68	0.00	0.00	0.00	0.84	0.84	0.00	0.00	0.84	0.00	0.84	2.53	2.53	0.84
C17ME45B.4	CO4	2.63	1.75	1.75	0.00	0.00	0.88	0.88	0.00	0.00	0.88	0.00	0.88	2.63	2.63	0.88
C17ME45B.5	CO5	2.37	1.58	1.58	0.00	0.00	0.79	0.79	0.00	0.00	0.79	0.00	0.79	2.37	2.37	0.79
DIRECT ATTAINMENT		2.38	1.75	1.67	0.00	0.00	0.79	0.79	0.00	0.00	0.79	0.00	0.79	2.38	2.22	0.79

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.53	1.90	1.69	0.00	0.00	0.84	0.84	0.00	0.00	0.84	0.00	0.84	2.53	2.36	0.84
ASSIGNMENT AND QUIZ	0.58	0.43	0.39	0.00	0.00	0.19	0.19	0.00	0.00	0.19	0.00	0.19	0.58	0.54	0.19
CONTINUOUS INTERNAL EVALUATION	1.90	1.40	1.33	0.00	0.00	0.63	0.63	0.00	0.00	0.63	0.00	0.63	1.90	1.78	0.63
FINAL DIRECT ATTAINMENT	2.52	1.88	1.69	0.00	0.00	0.84	0.84	0.00	0.00	0.84	0.00	0.84	2.52	2.35	0.84

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.52	1.88	1.69	0.00	0.00	0.84	0.84	0.00	0.00	0.84	0.00	0.84	2.52	2.35	0.84
COURSE EXIT SURVEY	2.50	1.89	1.70	0.00	0.00	0.83	0.83	0.00	0.00	0.83	0.00	0.83	2.50	2.34	0.83
FINAL ATTAINMENT	2.52	1.89	1.69	0.00	0.00	0.84	0.84	0.00	0.00	0.84	0.00	0.84	2.52	2.35	0.84
% OF Attainment	83.9	83.8	84.7	0.0	0.0	83.9	83.9	0.0	0.0	83.9	0.0	83.9	83.9	83.9	83.9

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	KGB

BATCH	2019
SESSION	february 2019 To May 2019
SUBJECT	Machine Tools and Operation
SEMESTER	4C
SUB CODE	17ME45B

CLASS STRENGTH	55
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	To understand the construction and specification of different machine tools
CO2	To gain knowledge pertaining to relative motion and mechanics required for various machine tools
CO3	To develop knowledge of cutting tool materials and geometry of cutting tools
CO4	To apply mechanics of machining process and effect of various parameters on economics of machining
CO5	To analyze the wear and tear of cutting tools and economics of machining process

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME45B.1	CO1	3	0	0	0	0	1	1	0	0	1	0	1	3	2	1
C17ME45B.2	CO2	3	3	0	0	0	1	1	0	0	1	0	1	3	3	1
C17ME45B.3	CO3	3	2	0	0	0	1	1	0	0	1	0	1	3	3	1
C17ME45B.4	CO4	3	2	2	0	0	1	1	0	0	1	0	1	3	3	1
C17ME45B.5	CO5	3	2	2	0	0	1	1	0	0	1	0	1	3	3	1
CO - PO LEVEL		3.0	2.3	2.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	3.0	2.8	1.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	55	100.00%	78%	83%
CO2	51	92.73%	78%	81%
CO3	55	100.00%	78%	83%
CO4	52	100.00%	78%	83%
CO5	51	92.73%	78%	81%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	83%	3	80.1%	3	82%	3
CO2	81%	3	84.3%	3	82%	3
CO3	83%	3	81.9%	3	83%	3
CO4	83%	3	84.7%	3	83%	3
CO5	81%	3	85.7%	3	82%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME45B.1	CO1	3.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	3.00	2.00	1.00
C17ME45B.2	CO2	2.78	2.78	0.00	0.00	0.00	0.93	0.93	0.00	0.00	0.93	0.00	0.93	2.78	2.78	0.93
C17ME45B.3	CO3	3.00	2.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	3.00	3.00	1.00
C17ME45B.4	CO4	3.00	2.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	3.00	3.00	1.00
C17ME45B.5	CO5	2.78	1.85	1.85	0.00	0.00	0.93	0.93	0.00	0.00	0.93	0.00	0.93	2.78	2.78	0.93
DIRECT ATTAINMENT		2.91	2.16	1.93	0.00	0.00	0.97	0.97	0.00	0.00	0.97	0.00	0.97	2.91	2.71	0.97

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.35	1.76	1.57	0.00	0.00	0.78	0.78	0.00	0.00	0.78	0.00	0.78	2.35	2.19	0.78
ASSIGNMENT AND QUIZ	0.59	0.44	0.39	0.00	0.00	0.20	0.20	0.00	0.00	0.20	0.00	0.20	0.59	0.55	0.20
CONTINUOUS INTERNAL EVALUATION	2.33	1.73	1.54	0.00	0.00	0.78	0.78	0.00	0.00	0.78	0.00	0.78	2.33	2.17	0.78
FINAL DIRECT ATTAINMENT	2.46	1.84	1.64	0.00	0.00	0.82	0.82	0.00	0.00	0.82	0.00	0.82	2.46	2.30	0.82

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.46	1.84	1.64	0.00	0.00	0.82	0.82	0.00	0.00	0.82	0.00	0.82	2.46	2.30	0.82
COURSE EXIT SURVEY	2.50	1.89	1.70	0.00	0.00	0.83	0.83	0.00	0.00	0.83	0.00	0.83	2.50	2.34	0.83
FINAL ATTAINMENT	2.47	1.85	1.65	0.00	0.00	0.82	0.82	0.00	0.00	0.82	0.00	0.82	2.47	2.30	0.82
% OF Attainment	82.2	82.1	82.3	0.0	0.0	82.2	82.2	0.0	0.0	82.2	0.0	82.2	82.2	82.2	82.2

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	HCM

BATCH	2018 -2019
SESSION	February 2019 - May 2019
SUBJECT	Mechanical Measurements and Metrology
SEMESTER	4A
SUB CODE	17ME46B

CLASS STRENGTH	56
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand the objectives of metrology, methods of measurement, selection of measuring instruments, standards of measurement and calibration of end bars. Describe slip gauges, wringing of slip gauges and building of slip gauges, angle measurement using sine bar, sine center, angle gauges, optical instruments and straightness measurement using Autocollimator.
CO2	Explain tolerance, limits of size, fits, geometric and position tolerances, gauges and their design.
CO3	Understand the principle of Johnson Mikrokator, sigma comparator, dial indicator, LVDT, back pressure gauges, Solex comparators and Zeiss Ultra Optimeter
CO4	Explain measurement systems, transducers, intermediate modifying devices and terminating devices.
CO5	Describe functioning of force, torque, pressure, strain and temperature measuring devices.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME46B.1	CO1	3	1	0	0	0	1	2	1	0	1	0	2	1	0	2
C17ME46B.2	CO2	3	3	2	0	0	0	2	1	0	1	0	1	1	0	2
C17ME46B.3	CO3	3	2	0	0	0	2	0	1	0	1	0	2	1	0	2
C17ME46B.4	CO4	3	1	0	0	0	2	0	1	0	1	0	1	1	0	2
C17ME46B.5	CO5	3	1	0	0	0	0	0	1	0	1	0	1	1	0	2
CO - PO LEVEL		3.0	1.6	2.0	0.0	0.0	1.7	2.0	1.0	0.0	1.0	0.0	1.4	1.0	0.0	2.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	30	60.00%	72%	69%
CO2	18	37.50%	72%	65%
CO3	24	47.06%	72%	67%
CO4	41	75.93%	72%	72%
CO5	35	67.31%	72%	71%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	69%	2	80.8%	3	70%	2
CO2	65%	2	82.7%	3	67%	2
CO3	67%	2	79.5%	3	68%	2
CO4	72%	2	81.3%	3	73%	2
CO5	71%	2	78.5%	3	71%	2

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME46B.1	CO1	1.80	0.60	0.00	0.00	0.00	0.60	1.20	0.60	0.00	0.60	0.00	1.20	0.60	0.00	1.20
C17ME46B.2	CO2	1.13	1.13	0.75	0.00	0.00	0.00	0.75	0.38	0.00	0.38	0.00	0.38	0.38	0.00	0.75
C17ME46B.3	CO3	1.41	0.94	0.00	0.00	0.00	0.94	0.00	0.47	0.00	0.47	0.00	0.94	0.47	0.00	0.94
C17ME46B.4	CO4	2.28	0.76	0.00	0.00	0.00	1.52	0.00	0.76	0.00	0.76	0.00	0.76	0.76	0.00	1.52
C17ME46B.5	CO5	2.02	0.67	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.67	0.00	0.67	0.67	0.00	1.35
DIRECT ATTAINMENT		1.73	0.82	0.75	0.00	0.00	1.02	0.98	0.58	0.00	0.58	0.00	0.79	0.58	0.00	1.15

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.15	1.14	1.43	0.00	0.00	1.19	1.43	0.72	0.00	0.72	0.00	1.00	0.72	0.00	1.43
ASSIGNMENT AND QUIZ	0.56	0.30	0.37	0.00	0.00	0.31	0.37	0.19	0.00	0.19	0.00	0.26	0.19	0.00	0.37
CONTINUOUS INTERNAL EVALUATION	1.38	0.66	0.60	0.00	0.00	0.82	0.78	0.46	0.00	0.46	0.00	0.63	0.46	0.00	0.92
FINAL DIRECT ATTAINMENT	2.10	1.11	1.34	0.00	0.00	1.18	1.37	0.70	0.00	0.70	0.00	0.98	0.70	0.00	1.40

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.10	1.11	1.34	0.00	0.00	1.18	1.37	0.70	0.00	0.70	0.00	0.98	0.70	0.00	1.40
COURSE EXIT SURVEY	2.42	1.29	1.65	0.00	0.00	1.34	1.63	0.81	0.00	0.81	0.00	1.13	0.81	0.00	1.61
FINAL ATTAINMENT	2.14	1.12	1.37	0.00	0.00	1.19	1.40	0.71	0.00	0.71	0.00	0.99	0.71	0.00	1.42
% OF Attainment	71.2	70.3	68.5	0.0	0.0	71.7	70.0	71.2	0.0	71.2	0.0	71.0	71.2	0.0	71.2

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	NR

BATCH	2017 -2018
SESSION	FEB 2018 To July 2018
SUBJECT	Mechanical Measurement and Metrology
SEMESTER	4th B & C
SUB CODE	17ME46B

CLASS STRENGTH	111
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	To Understand the objectives of metrology, methods of measurement, standards of measurement and calibration of end bars. Describe wringing of slip gauges and building of slip gauges, angle measurement and straightness measurement.
CO2	To Explain tolerance, limits of size, fits, geometric and position tolerances, gauges and their design. To Understand the principle of Johnson comparators.
CO3	To Describe measurement of major diameter, minor diameter, pitch, angle and effective diameter of screw threads. To Explain measurement of tooth thickness composite error and measurement of pitch, concentricity, run out and involute profile. Understand laser interferometers and Coordinate measuring machines
CO4	To Explain measurement systems, transducers, intermediate modifying devices and terminating devices.
CO5	To Describe functioning of force, torque, pressure, strain and temperature measuring devices.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME46B.1	CO1	3	1	0	0	0	1	2	1	0	1	0	2	1	0	2
C17ME46B.2	CO2	3	3	2	0	0	0	2	1	0	1	0	1	1	0	2
C17ME46B.3	CO3	3	2	0	0	0	2	0	1	0	1	0	2	1	0	2
C17ME46B.4	CO4	3	1	0	0	0	2	0	1	0	1	0	1	1	0	2
C17ME46B.5	CO5	3	1	0	0	0	0	0	1	0	1	0	1	1	0	2
CO - PO LEVEL		3.0	1.6	2.0	0.0	0.0	1.7	2.0	1.0	0.0	1.0	0.0	1.4	1.0	0.0	2.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	73	65.77%	79%	77%
CO2	43	38.74%	79%	71%
CO3	51	47.22%	79%	73%
CO4	55	49.55%	79%	73%
CO5	50	45.45%	79%	73%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	77%	3	80.8%	3	77%	3
CO2	71%	2	82.7%	3	72%	2
CO3	73%	2	79.5%	3	74%	2
CO4	73%	2	81.3%	3	74%	2
CO5	73%	2	78.5%	3	73%	2

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME46B.1	CO1	1.97	0.66	0.00	0.00	0.00	0.66	1.32	0.66	0.00	0.66	0.00	1.32	0.66	0.00	1.32
C17ME46B.2	CO2	1.16	1.16	0.77	0.00	0.00	0.00	0.77	0.39	0.00	0.39	0.00	0.39	0.39	0.00	0.77
C17ME46B.3	CO3	1.42	0.94	0.00	0.00	0.00	0.94	0.00	0.47	0.00	0.47	0.00	0.94	0.47	0.00	0.94
C17ME46B.4	CO4	1.49	0.50	0.00	0.00	0.00	0.99	0.00	0.50	0.00	0.50	0.00	0.50	0.50	0.00	0.99
C17ME46B.5	CO5	1.36	0.45	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.45	0.00	0.45	0.45	0.00	0.91
DIRECT ATTAINMENT		1.48	0.74	0.77	0.00	0.00	0.86	1.05	0.49	0.00	0.49	0.00	0.72	0.49	0.00	0.99

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.38	1.27	1.59	0.00	0.00	1.32	1.59	0.79	0.00	0.79	0.00	1.11	0.79	0.00	1.59
ASSIGNMENT AND QUIZ	0.60	0.32	0.40	0.00	0.00	0.33	0.40	0.20	0.00	0.20	0.00	0.28	0.20	0.00	0.40
CONTINUOUS INTERNAL EVALUATION	1.18	0.59	0.62	0.00	0.00	0.69	0.84	0.39	0.00	0.39	0.00	0.58	0.39	0.00	0.79
FINAL DIRECT ATTAINMENT	2.26	1.20	1.47	0.00	0.00	1.26	1.52	0.75	0.00	0.75	0.00	1.06	0.75	0.00	1.51

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.26	1.20	1.47	0.00	0.00	1.26	1.52	0.75	0.00	0.75	0.00	1.06	0.75	0.00	1.51
COURSE EXIT SURVEY	2.42	1.29	1.65	0.00	0.00	1.34	1.63	0.81	0.00	0.81	0.00	1.13	0.81	0.00	1.61
FINAL ATTAINMENT	2.28	1.21	1.49	0.00	0.00	1.27	1.53	0.76	0.00	0.76	0.00	1.07	0.76	0.00	1.52
% OF Attainment	*75.8*	*75.5*	*74.5*	*0.0*	*0.0*	*76.2*	*76.4*	*75.8*	*0.0*	*75.8*	*0.0*	*76.1*	*75.8*	*0.0*	*75.8*

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	0

BATCH	2018-2019
SESSION	JAN-AUG 2019
SUBJECT	MMM LAB
SEMESTER	4
SUB CODE	17MEL407

CLASS STRENGTH	168
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
100%	0%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Calibrate different instruments
CO2	Apply the concept of measuring thread profile of different components in mechanical engineering industry.
CO3	Evaluate Angular measurement of Various entities.
CO4	Evaluate force of components using measuring devices.
CO5	Evaluate surface irregularities of components using measuring devices.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MEL407.1	CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEL407.2	CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEL407.3	CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEL407.4	CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEL407.5	CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO - PO LEVEL		2.0	3.0	3.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	2.0	1.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			S E E	Final Direct C O % Attainment
CO1	164	98.20%	97%	97%
CO2	164	98.20%	97%	97%
CO3	164	98.20%	97%	97%
CO4	164	98.20%	97%	97%
CO5	164	98.20%	97%	97%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	97%	3	78.5%	3	95%	3
CO2	97%	3	83.1%	3	96%	3
CO3	97%	3	81.7%	3	96%	3
CO4	97%	3	84.0%	3	96%	3
CO5	97%	3	82.2%	3	96%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MEL407.1	CO1	1.96	2.95	2.95	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.96	0.98	0.00	0.00
C17MEL407.2	CO2	1.96	2.95	2.95	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.96	0.98	0.00	0.00
C17MEL407.3	CO3	1.96	2.95	2.95	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.96	0.98	0.00	0.00
C17MEL407.4	CO4	1.96	2.95	2.95	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.96	0.98	0.00	0.00
C17MEL407.5	CO5	1.96	2.95	2.95	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.96	0.98	0.00	0.00
DIRECT ATTAINMENT		1.96	2.95	2.95	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.96	0.98	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.94	2.91	2.91	0.00	0.00	0.00	0.00	0.97	0.00	0.97	0.00	1.94	0.97	0.00	0.00
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	1.96	2.95	2.95	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.96	0.98	0.00	0.00
FINAL DIRECT ATTAINMENT	1.95	2.92	2.92	0.00	0.00	0.00	0.00	0.97	0.00	0.97	0.00	1.95	0.97	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.95	2.92	2.92	0.00	0.00	0.00	0.00	0.97	0.00	0.97	0.00	1.95	0.97	0.00	0.00
COURSE EXIT SURVEY	1.64	2.46	2.46	0.00	0.00	0.00	0.00	0.82	0.00	0.82	0.00	1.64	0.82	0.00	0.00
FINAL ATTAINMENT	1.91	2.87	2.87	0.00	0.00	0.00	0.00	0.96	0.00	0.96	0.00	1.91	0.96	0.00	0.00
% OF Attainment	95.7	95.7	95.7	0.0	0.0	0.0	0.0	95.7	0.0	95.7	0.0	95.7	95.7	0.0	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	0

BATCH	2018 -2019
SESSION	FEB 2019 To July 2019
SUBJECT	MACHINE SHOP
SEMESTER	4
SUB CODE	17MEL48

CLASS STRENGTH	168
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
100%	0%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Operate lathe machine tool for various turning operations in a given cylindrical specimen.
CO2	Operate shaping machine for various machining operations in a given cubical specimen.
CO3	Operate shaping machine for various machining operations in a given cubical specimen.
CO4	Operate shaping machine for various machining operations in a given cubical specimen.
CO5	Operate milling machine for producing a spur gear in a given blank diameter or the number of teeth through simple indexing procedures.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MEL48.1	CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEL48.2	CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEL48.3	CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEL48.4	CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEL48.5	CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO - PO LEVEL		2.0	3.0	3.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	2.0	1.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			S E E	Final Direct C O % Attainment
Target>=60				
CO1	164	98.20%	97%	97%
CO2	164	98.20%	97%	97%
CO3	164	98.20%	97%	97%
CO4	164	98.20%	97%	97%
CO5	164	98.20%	97%	97%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	97%	3	85.8%	3	96%	3
CO2	97%	3	85.8%	3	96%	3
CO3	97%	3	85.4%	3	96%	3
CO4	97%	3	83.6%	3	96%	3
CO5	97%	3	82.7%	3	96%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MEL48.1	CO1	1.96	2.95	2.95	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.96	0.98	0.00	0.00
C17MEL48.2	CO2	1.96	2.95	2.95	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.96	0.98	0.00	0.00
C17MEL48.3	CO3	1.96	2.95	2.95	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.96	0.98	0.00	0.00
C17MEL48.4	CO4	1.96	2.95	2.95	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.96	0.98	0.00	0.00
C17MEL48.5	CO5	1.96	2.95	2.95	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.96	0.98	0.00	0.00
DIRECT ATTAINMENT		1.96	2.95	2.95	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.96	0.98	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.94	2.91	2.91	0.00	0.00	0.00	0.00	0.97	0.00	0.97	0.00	1.94	0.97	0.00	0.00
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	1.96	2.95	2.95	0.00	0.00	0.00	0.00	0.98	0.00	0.98	0.00	1.96	0.98	0.00	0.00
FINAL DIRECT ATTAINMENT	1.95	2.92	2.92	0.00	0.00	0.00	0.00	0.97	0.00	0.97	0.00	1.95	0.97	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.95	2.92	2.92	0.00	0.00	0.00	0.00	0.97	0.00	0.97	0.00	1.95	0.97	0.00	0.00
COURSE EXIT SURVEY	1.69	2.54	2.54	0.00	0.00	0.00	0.00	0.85	0.00	0.85	0.00	1.69	0.85	0.00	0.00
FINAL ATTAINMENT	1.92	2.88	2.88	0.00	0.00	0.00	0.00	0.96	0.00	0.96	0.00	1.92	0.96	0.00	0.00
% OF Attainment	96.0	96.0	96.0	0.0	0.0	0.0	0.0	96.0	0.0	96.0	0.0	96.0	96.0	0.0	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	0

BATCH	2018-2019
SESSION	AUG 2018 To DEC 2018
SUBJECT	Materials Testing Lab
SEMESTER	3
SUB CODE	17MELA307

CLASS STRENGTH	169
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
100%	0%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand specimen preparation for metallographic examination, microstructures and heat treatment processes.
CO2	Understand wear characteristics of ferrous , non ferrous and composite material and learn about non destructive testing experiments.
CO3	Operate Universal Testing Machine for tensile, shear and compression tests of metallic and non metallic specimens and evaluate their properties.
CO4	Operate Universal Testing Machine for bending tests of metallic and non metallic specimens and evaluate their mechanical properties.
CO5	Evaluate hardness of M.S, C.I Specimen by conducting Izod , Charpy, Brinell, Rockwell and Vicker's hardness tests.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MELA307.1	CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MELA307.2	CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MELA307.3	CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MELA307.4	CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MELA307.5	CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO - PO LEVEL		2.0	3.0	3.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	2.0	1.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	163	96.45%	91%	92%
CO2	163	96.45%	91%	92%
CO3	163	96.45%	91%	92%
CO4	163	96.45%	91%	92%
CO5	163	96.45%	91%	92%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	92%	3	85.6%	3	92%	3
CO2	92%	3	85.6%	3	92%	3
CO3	92%	3	84.3%	3	91%	3
CO4	92%	3	85.4%	3	92%	3
CO5	92%	3	85.1%	3	91%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MELA307.1	CO1	1.93	2.89	2.89	0.00	0.00	0.00	0.00	0.96	0.00	0.96	0.00	1.93	0.96	0.00	0.00
C17MELA307.2	CO2	1.93	2.89	2.89	0.00	0.00	0.00	0.00	0.96	0.00	0.96	0.00	1.93	0.96	0.00	0.00
C17MELA307.3	CO3	1.93	2.89	2.89	0.00	0.00	0.00	0.00	0.96	0.00	0.96	0.00	1.93	0.96	0.00	0.00
C17MELA307.4	CO4	1.93	2.89	2.89	0.00	0.00	0.00	0.00	0.96	0.00	0.96	0.00	1.93	0.96	0.00	0.00
C17MELA307.5	CO5	1.93	2.89	2.89	0.00	0.00	0.00	0.00	0.96	0.00	0.96	0.00	1.93	0.96	0.00	0.00
DIRECT ATTAINMENT		1.93	2.89	2.89	0.00	0.00	0.00	0.00	0.96	0.00	0.96	0.00	1.93	0.96	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.82	2.73	2.73	0.00	0.00	0.00	0.00	0.91	0.00	0.91	0.00	1.82	0.91	0.00	0.00
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	1.93	2.89	2.89	0.00	0.00	0.00	0.00	0.96	0.00	0.96	0.00	1.93	0.96	0.00	0.00
FINAL DIRECT ATTAINMENT	1.84	2.77	2.77	0.00	0.00	0.00	0.00	0.92	0.00	0.92	0.00	1.84	0.92	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.84	2.77	2.77	0.00	0.00	0.00	0.00	0.92	0.00	0.92	0.00	1.84	0.92	0.00	0.00
COURSE EXIT SURVEY	1.70	2.56	2.56	0.00	0.00	0.00	0.00	0.85	0.00	0.85	0.00	1.70	0.85	0.00	0.00
FINAL ATTAINMENT	1.83	2.74	2.74	0.00	0.00	0.00	0.00	0.91	0.00	0.91	0.00	1.83	0.91	0.00	0.00
% OF Attainment	91.5	91.5	91.5	0.0	0.0	0.0	0.0	91.5	0.0	91.5	0.0	91.5	91.5	0.0	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	0

BATCH	2018-2019
SESSION	AUG 2018To DEC 2018
SUBJECT	Foundry and Forging Lab
SEMESTER	3
SUB CODE	17MELA308

CLASS STRENGTH	169
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
100%	0%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Analyze and optimize foundry sand, core sand to a particular application.
CO2	Build moulds with or without patterns.
CO3	Understand casting of ferrous and non ferrous objects.
CO4	Develop skills in making forging models manually
CO5	Develop skills in making forging models with the help of power hammers

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MELA308.1	CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MELA308.2	CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MELA308.3	CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MELA308.4	CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MELA308.5	CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO - PO LEVEL		2.0	3.0	3.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	2.0	1.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	163	98.79%	96%	97%
CO2	163	98.79%	96%	97%
CO3	163	98.79%	96%	97%
CO4	163	98.79%	96%	97%
CO5	163	98.79%	96%	97%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	97%	3	87.5%	3	96%	3
CO2	97%	3	85.6%	3	96%	3
CO3	97%	3	84.2%	3	96%	3
CO4	97%	3	86.5%	3	96%	3
CO5	97%	3	85.6%	3	96%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MELA308.1	CO1	1.98	2.96	2.96	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	1.98	0.99	0.00	0.00
C17MELA308.2	CO2	1.98	2.96	2.96	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	1.98	0.99	0.00	0.00
C17MELA308.3	CO3	1.98	2.96	2.96	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	1.98	0.99	0.00	0.00
C17MELA308.4	CO4	1.98	2.96	2.96	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	1.98	0.99	0.00	0.00
C17MELA308.5	CO5	1.98	2.96	2.96	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	1.98	0.99	0.00	0.00
DIRECT ATTAINMENT		1.98	2.96	2.96	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	1.98	0.99	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.93	2.89	2.89	0.00	0.00	0.00	0.00	0.96	0.00	0.96	0.00	1.93	0.96	0.00	0.00
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	1.98	2.96	2.96	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	1.98	0.99	0.00	0.00
FINAL DIRECT ATTAINMENT	1.94	2.91	2.91	0.00	0.00	0.00	0.00	0.97	0.00	0.97	0.00	1.94	0.97	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.94	2.91	2.91	0.00	0.00	0.00	0.00	0.97	0.00	0.97	0.00	1.94	0.97	0.00	0.00
COURSE EXIT SURVEY	1.72	2.58	2.58	0.00	0.00	0.00	0.00	0.86	0.00	0.86	0.00	1.72	0.86	0.00	0.00
FINAL ATTAINMENT	1.92	2.87	2.87	0.00	0.00	0.00	0.00	0.96	0.00	0.96	0.00	1.92	0.96	0.00	0.00
% OF Attainment	95.8	95.8	95.8	0.0	0.0	0.0	0.0	95.8	0.0	95.8	0.0	95.8	95.8	0.0	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	VR

BATCH	2019 -2020
SESSION	August 2020 To December 2020
SUBJECT	Management and Economics
SEMESTER	5ABC
SUB CODE	17ME51

CLASS STRENGTH	154
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand needs, scope functions and roles ,scope and evolution of management
CO2	understand importance and purpose of planning, hierarchy of planning, and analyze its types, decision making, organizing, staffing, directing and controlling
CO3	Select the best economic model from the available best alternatives
CO4	Understand various interest rates and impelent the suitable one
CO5	Estimate various depreciation values of commodities

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME51.1	CO1	2					1		1		3		3	1		1
C17ME51.2	CO2	2					2			3	3		3	1		1
C17ME51.3	CO3	2	2				2			2	3		3	1		1
C17ME51.4	CO4	3	2			1			1	1	3		3	1		1
C17ME51.5	CO5	3	2			1			1	1	3		3	1		1
CO - PO LEVEL		2.4	2.0	0.0	0.0	1.0	1.7	0.0	1.0	1.8	3.0	0.0	3.0	1.0	0.0	1.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	140	91.50%	81%	83%
CO2	154	100.00%	81%	85%
CO3	110	71.43%	81%	79%
CO4	145	94.77%	81%	83%
CO5	151	98.05%	81%	84%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	83%	3	81.1%	3	83%	3
CO2	85%	3	83.5%	3	84%	3
CO3	79%	3	77.9%	3	79%	3
CO4	83%	3	79.1%	3	83%	3
CO5	84%	3	78.3%	3	84%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME51.1	CO1	1.83	0.00	0.00	0.00	0.00	0.92	0.00	0.92	0.00	2.75	0.00	2.75	0.92	0.00	0.92
C17ME51.2	CO2	2.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	3.00	3.00	0.00	3.00	1.00	0.00	1.00
C17ME51.3	CO3	1.43	1.43	0.00	0.00	0.00	1.43	0.00	0.00	1.43	2.14	0.00	2.14	0.71	0.00	0.71
C17ME51.4	CO4	2.84	1.90	0.00	0.00	0.95	0.00	0.00	0.95	0.95	2.84	0.00	2.84	0.95	0.00	0.95
C17ME51.5	CO5	2.94	1.96	0.00	0.00	0.98	0.00	0.00	0.98	0.98	2.94	0.00	2.94	0.98	0.00	0.98
DIRECT ATTAINMENT		2.21	1.76	0.00	0.00	0.96	1.45	0.00	0.95	1.59	2.73	0.00	2.73	0.91	0.00	0.91

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.94	1.61	0.00	0.00	0.81	1.34	0.00	0.81	1.41	2.42	0.00	2.42	0.81	0.00	0.81
ASSIGNMENT AND QUIZ	0.48	0.40	0.00	0.00	0.20	0.33	0.00	0.20	0.35	0.60	0.00	0.60	0.20	0.00	0.20
CONTINUOUS INTERNAL EVALUATION	1.77	1.41	0.00	0.00	0.77	1.16	0.00	0.76	1.27	2.19	0.00	2.19	0.73	0.00	0.73
FINAL DIRECT ATTAINMENT	2.00	1.65	0.00	0.00	0.84	1.37	0.00	0.84	1.45	2.49	0.00	2.49	0.83	0.00	0.83

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.00	1.65	0.00	0.00	0.84	1.37	0.00	0.84	1.45	2.49	0.00	2.49	0.83	0.00	0.83
COURSE EXIT SURVEY	1.91	1.57	0.00	0.00	0.79	1.35	0.00	0.80	1.41	2.40	0.00	2.40	0.80	0.00	0.80
FINAL ATTAINMENT	1.99	1.64	0.00	0.00	0.83	1.37	0.00	0.83	1.45	2.48	0.00	2.48	0.83	0.00	0.83
% OF Attainment	82.9	82.2	0.0	0.0	83.4	82.3	0.0	83.3	82.8	82.8	0.0	82.8	82.8	0.0	82.8

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	CSB

BATCH	2019 -2020
SESSION	August 2019 To December 2019
SUBJECT	Dynamics of Machinery
SEMESTER	5A
SUB CODE	17ME52

CLASS STRENGTH	51
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Determine the forces and couples for static and dynamic conditions of four bars and slider crank mechanisms to keep the system in equilibrium.
CO2	Determine magnitude and angular position of balancing masses under static and dynamic condition of rotating masses in same and different planes and determine unbalanced primary, secondary forces and couples in single and multi-cylinder engine.
CO3	Determine sensitiveness, isochronisms, effort and power of porter and Hartnell governors. Determine gyroscopic couple and effects related to 2, 4 wheeler, plane disc, ship and aeroplanes.
CO4	Understand types of vibration, SHM and methods of finding natural frequencies of simple mechanical systems.
CO5	Determine equation of motion, natural frequency, damping factor, logarithmic decrement of damped free-vibration (SDOF) systems. Determine equation of motion of rotating and reciprocating unbalance systems, magnification factor, andtransmissibilityof forced vibration (SDOF) systems.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME52.1	CO1	3	3	1	0	3	1	0	1	0	0	0	1	3	3	2
C17ME52.2	CO2	3	3	1	0	3	1	0	1	0	0	0	1	1	2	2
C17ME52.3	CO3	3	3	1	0	2	1	0	1	0	0	0	1	3	3	3
C17ME52.4	CO4	3	3	2	0	0	1	0	1	0	0	0	1	2	3	2
C17ME52.5	CO5	3	3	2	0	0	1	0	1	0	0	0	1	3	3	3
CO - PO LEVEL		3.0	3.0	1.4	0.0	2.7	1.0	0.0	1.0	0.0	0.0	0.0	1.0	2.4	2.8	2.4

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	40	80.00%	75%	76%
CO2	34	66.67%	75%	73%
CO3	42	84.00%	75%	77%
CO4	38	79.17%	75%	76%
CO5	47	94.00%	75%	79%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	76%	3	79.5%	3	76%	3
CO2	73%	2	78.3%	3	74%	2
CO3	77%	3	78.7%	3	77%	3
CO4	76%	3	82.5%	3	76%	3
CO5	79%	3	78.3%	3	79%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME52.1	CO1	2.40	2.40	0.80	0.00	2.40	0.80	0.00	0.80	0.00	0.00	0.00	0.80	2.40	2.40	1.60
C17ME52.2	CO2	2.00	2.00	0.67	0.00	2.00	0.67	0.00	0.67	0.00	0.00	0.00	0.67	0.67	1.33	1.33
C17ME52.3	CO3	2.52	2.52	0.84	0.00	1.68	0.84	0.00	0.84	0.00	0.00	0.00	0.84	2.52	2.52	2.52
C17ME52.4	CO4	2.38	2.38	1.58	0.00	0.00	0.79	0.00	0.79	0.00	0.00	0.00	0.79	1.58	2.38	1.58
C17ME52.5	CO5	2.82	2.82	1.88	0.00	0.00	0.94	0.00	0.94	0.00	0.00	0.00	0.94	2.82	2.82	2.82
DIRECT ATTAINMENT		2.42	2.42	1.15	0.00	2.03	0.81	0.00	0.81	0.00	0.00	0.00	0.81	2.00	2.29	1.97

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.24	2.24	1.05	0.00	1.99	0.75	0.00	0.75	0.00	0.00	0.00	0.75	1.79	2.09	1.79
ASSIGNMENT AND QUIZ	0.59	0.59	0.27	0.00	0.52	0.20	0.00	0.20	0.00	0.00	0.00	0.20	0.47	0.55	0.47
CONTINUOUS INTERNAL EVALUATION	1.94	1.94	0.92	0.00	1.62	0.65	0.00	0.65	0.00	0.00	0.00	0.65	1.60	1.83	1.58
FINAL DIRECT ATTAINMENT	2.30	2.30	1.08	0.00	2.02	0.77	0.00	0.77	0.00	0.00	0.00	0.77	1.85	2.15	1.84

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.30	2.30	1.08	0.00	2.02	0.77	0.00	0.77	0.00	0.00	0.00	0.77	1.85	2.15	1.84
COURSE EXIT SURVEY	2.38	2.38	1.12	0.00	2.10	0.79	0.00	0.79	0.00	0.00	0.00	0.79	1.91	2.23	1.90
FINAL ATTAINMENT	2.31	2.31	1.08	0.00	2.03	0.77	0.00	0.77	0.00	0.00	0.00	0.77	1.85	2.16	1.85
% OF Attainment	76.9	76.9	77.1	0.0	76.1	76.9	0.0	76.9	0.0	0.0	0.0	76.9	77.2	77.0	77.1

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	LBW

BATCH	2019 -2020
SESSION	August 2019 To December 2019
SUBJECT	Dynamics of Machines
SEMESTER	5 B
SUB CODE	17ME52

CLASS STRENGTH	52
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Determine the forces and couples for static and dynamic conditions of four bars and slider crank mechanisms to keep the system in equilibrium.
CO2	Determine magnitude and angular position of balancing masses under static and dynamic condition of rotating masses in same and different planes and determine unbalanced primary, secondary forces and couples in single and multi-cylinder engine
CO3	Determine sensitiveness, isochronisms, effort and power of porter and Hartnell governors. Determine gyroscopic couple and effects related to 2, 4 wheeler, plane disc, ship and aeroplanes.
CO4	Understandtypesofvibration,SHMandmethodsoffindingnaturalfrequenciesofsimple mechanical systems.
CO5	Determine equation of motion, natural frequency, damping factor, logarithmic decrement of damped free-vibration (SDOF) systems. Determine equation of motion of rotating and reciprocating unbalance systems, magnification factor, and transmissibility of forced vibration (SDOF) systems.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME52.1	CO1	3	3	1	0	3	1	0	1	0	0	0	1	3	3	2
C17ME52.2	CO2	3	3	1	0	3	1	0	1	0	0	0	1	1	2	2
C17ME52.3	CO3	3	3	1	0	2	1	0	1	0	0	0	1	3	3	3
C17ME52.4	CO4	3	3	2	0	0	1	0	1	0	0	0	1	2	3	2
C17ME52.5	CO5	3	3	2	0	0	1	0	1	0	0	0	1	3	3	3
CO - PO LEVEL		3.0	3.0	1.4	0.0	2.7	1.0	0.0	1.0	0.0	0.0	0.0	1.0	2.4	2.8	2.4

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	48	92.31%	91%	91%
CO2	42	84.00%	91%	89%
CO3	48	92.31%	91%	91%
CO4	43	82.69%	91%	89%
CO5	45	86.54%	91%	90%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	91%	3	79.5%	3	90%	3
CO2	89%	3	78.3%	3	88%	3
CO3	91%	3	78.7%	3	90%	3
CO4	89%	3	82.5%	3	88%	3
CO5	90%	3	78.3%	3	89%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME52.1	CO1	2.77	2.77	0.92	0.00	2.77	0.92	0.00	0.92	0.00	0.00	0.00	0.92	2.77	2.77	1.85
C17ME52.2	CO2	2.52	2.52	0.84	0.00	2.52	0.84	0.00	0.84	0.00	0.00	0.00	0.84	0.84	1.68	1.68
C17ME52.3	CO3	2.77	2.77	0.92	0.00	1.85	0.92	0.00	0.92	0.00	0.00	0.00	0.92	2.77	2.77	2.77
C17ME52.4	CO4	2.48	2.48	1.65	0.00	0.00	0.83	0.00	0.83	0.00	0.00	0.00	0.83	1.65	2.48	1.65
C17ME52.5	CO5	2.60	2.60	1.73	0.00	0.00	0.87	0.00	0.87	0.00	0.00	0.00	0.87	2.60	2.60	2.60
DIRECT ATTAINMENT		2.63	2.63	1.21	0.00	2.38	0.88	0.00	0.88	0.00	0.00	0.00	0.88	2.13	2.46	2.11

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.72	2.72	1.27	0.00	2.41	0.91	0.00	0.91	0.00	0.00	0.00	0.91	2.17	2.54	2.17
ASSIGNMENT AND QUIZ	0.59	0.59	0.27	0.00	0.52	0.20	0.00	0.20	0.00	0.00	0.00	0.20	0.47	0.55	0.47
CONTINUOUS INTERNAL EVALUATION	2.10	2.10	0.97	0.00	1.90	0.70	0.00	0.70	0.00	0.00	0.00	0.70	1.70	1.97	1.69
FINAL DIRECT ATTAINMENT	2.71	2.71	1.26	0.00	2.42	0.90	0.00	0.90	0.00	0.00	0.00	0.90	2.17	2.53	2.17

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.71	2.71	1.26	0.00	2.42	0.90	0.00	0.90	0.00	0.00	0.00	0.90	2.17	2.53	2.17
COURSE EXIT SURVEY	2.38	2.38	1.12	0.00	2.10	0.79	0.00	0.79	0.00	0.00	0.00	0.79	1.91	2.23	1.90
FINAL ATTAINMENT	2.68	2.68	1.25	0.00	2.39	0.89	0.00	0.89	0.00	0.00	0.00	0.89	2.15	2.50	2.14
% OF Attainment	89.3	89.3	89.2	0.0	89.5	89.3	0.0	89.3	0.0	0.0	0.0	89.3	89.4	89.3	89.3

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	NCM

BATCH	2019 -2020
SESSION	August 2019 To December 2019
SUBJECT	Dynamics of Machinery
SEMESTER	5C
SUB CODE	17ME52

CLASS STRENGTH	51
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Determine the forces and couples for static and dynamic conditions of four bars and slider crank mechanisms to keep the system in equilibrium.
CO2	Determine magnitude and angular position of balancing masses under static and dynamic condition of rotating masses in same and different planes and determine unbalanced primary, secondary forces and couples in single and multi-cylinder engine.
CO3	Determine sensitiveness, isochronisms, effort and power of porter and Hartnell governors. Determine gyroscopic couple and effects related to 2, 4 wheeler, plane disc, ship and aeroplanes.
CO4	Understand types of vibration, SHM and methods of finding natural frequencies of simple mechanical systems.
CO5	Determine equation of motion, natural frequency, damping factor, logarithmic decrement of damped free-vibration (SDOF) systems. Determine equation of motion of rotating and reciprocating unbalance systems, magnification factor, andtransmissibilityof forced vibration (SDOF) systems.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME52.1	CO1	3	3	1	0	3	1	0	1	0	0	0	1	3	3	2
C17ME52.2	CO2	3	3	1	0	3	1	0	1	0	0	0	1	1	2	2
C17ME52.3	CO3	3	3	1	0	2	1	0	1	0	0	0	1	3	3	3
C17ME52.4	CO4	3	3	2	0	0	1	0	1	0	0	0	1	2	3	2
C17ME52.5	CO5	3	3	2	0	0	1	0	1	0	0	0	1	3	3	3
CO - PO LEVEL		3.0	3.0	1.4	0.0	2.7	1.0	0.0	1.0	0.0	0.0	0.0	1.0	2.4	2.8	2.4

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	36	72.00%	83%	80%
CO2	31	62.00%	83%	78%
CO3	46	90.20%	83%	84%
CO4	34	68.00%	83%	80%
CO5	44	86.27%	83%	83%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	80%	3	79.5%	3	80%	3
CO2	78%	3	78.3%	3	78%	3
CO3	84%	3	78.7%	3	84%	3
CO4	80%	3	82.5%	3	80%	3
CO5	83%	3	78.3%	3	83%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME52.1	CO1	2.16	2.16	0.72	0.00	2.16	0.72	0.00	0.72	0.00	0.00	0.00	0.72	2.16	2.16	1.44
C17ME52.2	CO2	1.86	1.86	0.62	0.00	1.86	0.62	0.00	0.62	0.00	0.00	0.00	0.62	0.62	1.24	1.24
C17ME52.3	CO3	2.71	2.71	0.90	0.00	1.80	0.90	0.00	0.90	0.00	0.00	0.00	0.90	2.71	2.71	2.71
C17ME52.4	CO4	2.04	2.04	1.36	0.00	0.00	0.68	0.00	0.68	0.00	0.00	0.00	0.68	1.36	2.04	1.36
C17ME52.5	CO5	2.59	2.59	1.73	0.00	0.00	0.86	0.00	0.86	0.00	0.00	0.00	0.86	2.59	2.59	2.59
DIRECT ATTAINMENT		2.27	2.27	1.07	0.00	1.94	0.76	0.00	0.76	0.00	0.00	0.00	0.76	1.89	2.15	1.87

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.48	2.48	1.16	0.00	2.20	0.83	0.00	0.83	0.00	0.00	0.00	0.83	1.98	2.31	1.98
ASSIGNMENT AND QUIZ	0.60	0.60	0.28	0.00	0.53	0.20	0.00	0.20	0.00	0.00	0.00	0.20	0.48	0.56	0.48
CONTINUOUS INTERNAL EVALUATION	1.82	1.82	0.85	0.00	1.55	0.61	0.00	0.61	0.00	0.00	0.00	0.61	1.51	1.72	1.49
FINAL DIRECT ATTAINMENT	2.46	2.46	1.15	0.00	2.18	0.82	0.00	0.82	0.00	0.00	0.00	0.82	1.98	2.30	1.98

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.46	2.46	1.15	0.00	2.18	0.82	0.00	0.82	0.00	0.00	0.00	0.82	1.98	2.30	1.98
COURSE EXIT SURVEY	2.38	2.38	1.12	0.00	2.10	0.79	0.00	0.79	0.00	0.00	0.00	0.79	1.91	2.23	1.90
FINAL ATTAINMENT	2.46	2.46	1.15	0.00	2.17	0.82	0.00	0.82	0.00	0.00	0.00	0.82	1.97	2.30	1.97
% OF Attainment	81.9	81.9	82.0	0.0	81.4	81.9	0.0	81.9	0.0	0.0	0.0	81.9	82.3	82.0	82.2

17ME53-TM-A

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

ESTD : 2001 An Institution with a Difference

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2015 - 19	CLASS STRENGTH	50		
SESSION	Aug - Dec 2019	SET TARGET FOR INTERNAL ASSESSMENT (%)	60	Internal Marks Weightage	
SUBJECT	Turbo Machines	SET TARGET FOR UNIVERSITY EXAMINATION (%)	45	Tests IA	Quiz + Assign
SEMESTER	5	WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	45%	75%	25%
SUB CODE	17ME54	WEIGHTAGE FOR SEMESTER END EXAMINATION	60%		

CO PO Mapping

CO1	Apply model studies and thermodynamic concepts in solving turbo machines problems
CO2	Learn about methods of energy storage Evaluate turbo machines using concepts of turbine equations and velocity triangles., energy management.
CO3	Analyse and evaluate performance of impulse and reaction steam turbines
CO4	Analyse and evaluate performance of hydraulic turbines
CO5	Analyse and evaluate performance of power absorbing turbo machines

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME54.1	CO1	3	2	2	1		0	0					1			
C17ME54.2	CO2	3	2	2	1		0	0					1			
C17ME54.3	CO3	3	2	2	2		1	1					1			
C17ME54.4	CO4	3	2	2	2		1	1					1			
C17ME54.5	CO5	3	2	2	2		1	1					1			
CO - PO LEVEL		3.0	2.0	2.0	1.6	0.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	44	95.65%
CO2	43	93.48%
CO3	30	66.67%
CO4	44	97.78%
CO5	43	95.56%
CO6	0	0.00%
CO7	0	0.00%
CO8	0	0.00%

Targets for SEE			Targets for InA		
ABOVE	60%	3	75%	3	
ABOVE	50%	2	60%	2	
ABOVE	45%	1	45%	1	

COURSE OUTCOMES	ATTAINMENT LEVEL IA		SEE		FINAL		Indirect Attainment		Final
CO1	95.65%	3	42%	0	90%	3	80%	3	3
CO2	93.48%	3	42%	0	88%	3	65%	2	2.9
CO3	66.67%	0	42%	0	64%	2	85%	3	2.1
CO4	97.78%	3	42%	0	92%	3	78%	3	3
CO5	95.56%	3	42%	0	90%	3	78%	3	3
CO6	0.00%	0	0%	0	0%	0		0	0
CO7	0.00%	0	0%	0	0%	0		0	0
CO8	0.00%	0	0%	0	0%	0		0	0

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME54.1	CO1	2.87	1.91	1.91	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00	0.00
C17ME54.2	CO2	2.80	1.87	1.87	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.00
C17ME54.3	CO3	2.00	1.33	1.33	1.33	0.00	0.67	0.67	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00
C17ME54.4	CO4	2.93	1.96	1.96	1.96	0.00	0.98	0.98	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00
C17ME54.5	CO5	2.87	1.91	1.91	1.91	0.00	0.96	0.96	0.00	0.00	0.00	0.00	0.96	0.00	0.00	0.00
C17ME54.6	CO6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C17ME54.7	CO7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C17ME54.8	CO8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DIRECT ATTAINMENT		2.69	1.80	1.80	1.42	0.00	0.87	0.87	0.00	0.00	0.00	0.00	0.90	0.00	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.26	0.84	0.84	0.67	0.00	0.42	0.42	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0.00
ASSIGNMENT AND QUIZ	0.74	0.49	0.49	0.39	0.00	0.25	0.25	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	2.02	1.35	1.35	1.06	0.00	0.65	0.65	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00
FINAL DIRECT ATTAINMENT	2.00	1.33	1.33	1.06	0.00	0.65	0.65	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.00	1.33	1.33	1.06	0.00	0.65	0.65	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00
PROGRAM EXIT SURVEY	2.32	1.54	1.54	1.25	0.00	0.80	0.80	0.00	0.00	0.00	0.00	0.77	0.00	0.00	0.00
FINAL ATTAINMENT	2.03	1.35	1.35	1.08	0.00	0.67	0.67	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

ESTD : 2001 An Institution with a Difference

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2015 - 19
SESSION	Aug - Dec 2019
SUBJECT	Turbo Machines
SEMESTER	5
SUB CODE	17ME54

CLASS STRENGTH	103
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage	
Tests IA	Quiz + Assign
100%	0%

CO PO Mapping : At the end of the course the student will be able to

CO1	Apply model studies and thermodynamic concepts in solving turbo machines problems
CO2	Learn about methods of energy storage Evaluate turbo machines using concepts of turbine equations and velocity triangles., energy management.
CO3	Analyse and evaluate performance of impulse and reaction steam turbines
CO4	Analyse and evaluate performance of hydraulic turbines
CO5	Analyse and evaluate performance of power absorbing turbo machines

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17ME54.1	CO1	3	2	2	1		0	0					1					
C17ME54.2	CO2	3	2	2	1		0	0					1					
C17ME54.3	CO3	3	2	2	2		1	1					1					
C17ME54.4	CO4	3	2	2	2		1	1					1					
C17ME54.5	CO5	3	2	2	2		1	1					1					
CO - PO LEVEL		3.0	2.0	2.0	1.6	0.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0		

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	77	75%
CO2	77	75%
CO3	77	75%
CO4	77	75%
CO5	77	75%

Targets for SEE			Targets for InA		
ABOVE	60%	3	75%	3	
ABOVE	50%	2	60%	2	
ABOVE	45%	1	45%	1	

COURSE OUTCOMES	CO ATTAINMENT LEVEL IA		SEE		FINAL		INDIRECT		TA	
CO1	75%	2	46%	1	51%	1.2	80%	3	54%	1
CO2	75%	2	46%	1	51%	1.2	65%	2	53%	1
CO3	75%	2	46%	1	51%	1.2	85%	3	55%	1
CO4	75%	2	46%	1	51%	1.2	78%	3	54%	1
CO5	75%	2	46%	1	51%	1.2	78%	3	54%	1

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17ME54.1	CO1	2.24	1.50	1.50	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00		
C17ME54.2	CO2	2.24	1.50	1.50	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00		
C17ME54.3	CO3	2.24	1.50	1.50	1.50	0.00	0.75	0.75	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00		
C17ME54.4	CO4	2.24	1.50	1.50	1.50	0.00	0.75	0.75	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00		
C17ME54.5	CO5	2.24	1.50	1.50	1.50	0.00	0.75	0.75	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00		
DIRECT ATTAINMENT		2.24	1.50	1.50	1.20	0.00	0.75	0.75	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00		

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
SEMESTER END EXAMINATION	1.37	0.91	0.91	0.73	0.00	0.46	0.46	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00		
ASSIGNMENT AND QUIZ\	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
CONTINUOUS INTERNAL EVALUATION	2.24	1.50	1.50	1.20	0.00	0.75	0.75	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00		
FINAL DIRECT ATTAINMENT	1.54	1.03	1.03	0.82	0.00	0.51	0.51	0.00	0.00	0.00	0.00	0.51	0.00	0.00	0.00		

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
FINAL DIRECT ATTAINMENT	1.54	1.03	1.03	0.82	0.00	0.51	0.51	0.00	0.00	0.00	0.00	0.51	0.00	0.00	0.00		
PROGRAM EXIT SURVEY	2.32	1.54	1.54	1.25	0.00	0.80	0.80	0.00	0.00	0.00	0.00	0.77	0.00	0.00	0.00		
FINAL ATTAINMENT	1.62	1.08	1.08	0.87	0.00	0.54	0.54	0.00	0.00	0.00	0.00	0.54	0.00	0.00	0.00		

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	Dr. SF

BATCH	2019-20
SESSION	August 2019 To December 2019
SUBJECT	Design of Machine Elements -I
SEMESTER	5A
SUB CODE	17ME54

CLASS STRENGTH	52
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Describe the design process, choose materials and Apply the codes and standards in design process.
CO2	Analyze the behavior of machine components under static, impact, fatigue loading using failure theories
CO3	Design shafts, joints, couplings.
CO4	Design of riveted and welded joints.
CO5	Design of threaded fasteners and power screws

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME54.1	CO1	1	1	3	0	0	2	3	3	0	0	3	2	3	2	0
C17ME54.2	CO2	3	3	3	2	0	2	1	3	2	0	3	2	3	2	0
C17ME54.3	CO3	3	3	3	2	0	2	1	3	2	0	3	2	3	2	0
C17ME54.4	CO4	3	3	3	2	0	2	1	3	2	0	3	2	3	2	0
C17ME54.5	CO5	3	3	3	2	0	2	1	3	2	0	3	2	3	2	0
CO - PO LEVEL		2.6	2.6	3.0	2.0	0.0	2.0	1.4	3.0	2.0	0.0	3.0	2.0	3.0	2.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	22	91.67%	46%	55%
CO2	38	73.08%	46%	52%
CO3	18	58.06%	46%	49%
CO4	49	94.23%	46%	56%
CO5	45	88.24%	46%	55%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	55%	1	77.1%	3	58%	1
CO2	52%	1	73.9%	2	54%	1
CO3	49%	1	75.1%	3	51%	1
CO4	56%	1	71.1%	2	58%	1
CO5	55%	1	73.2%	2	57%	1

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME54.1	CO1	1.00	1.00	3.00	0.00	0.00	2.00	3.00	3.00	0.00	0.00	3.00	2.00	3.00	2.00	0.00
C17ME54.2	CO2	3.00	3.00	3.00	2.00	0.00	2.00	1.00	3.00	2.00	0.00	3.00	2.00	3.00	2.00	0.00
C17ME54.3	CO3	3.00	3.00	3.00	2.00	0.00	2.00	1.00	3.00	2.00	0.00	3.00	2.00	3.00	2.00	0.00
C17ME54.4	CO4	3.00	3.00	3.00	2.00	0.00	2.00	1.00	3.00	2.00	0.00	3.00	2.00	3.00	2.00	0.00
C17ME54.5	CO5	3.00	3.00	3.00	2.00	0.00	2.00	1.00	3.00	2.00	0.00	3.00	2.00	3.00	2.00	0.00
DIRECT ATTAINMENT		2.60	2.60	3.00	2.00	0.00	2.00	1.40	3.00	2.00	0.00	3.00	2.00	3.00	2.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.21	1.21	1.39	0.93	0.00	0.93	0.65	1.39	0.93	0.00	1.39	0.93	1.39	0.93	0.00
ASSIGNMENT AND QUIZ	0.51	0.51	0.59	0.39	0.00	0.39	0.27	0.59	0.39	0.00	0.59	0.39	0.59	0.39	0.00
CONTINUOUS INTERNAL EVALUATION	2.08	2.08	2.40	1.60	0.00	1.60	1.12	2.40	1.60	0.00	2.40	1.60	2.40	1.60	0.00
FINAL DIRECT ATTAINMENT	1.48	1.48	1.71	1.14	0.00	1.14	0.80	1.71	1.14	0.00	1.71	1.14	1.71	1.14	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.48	1.48	1.71	1.14	0.00	1.14	0.80	1.71	1.14	0.00	1.71	1.14	1.71	1.14	0.00
COURSE EXIT SURVEY	1.91	1.91	2.22	1.47	0.00	1.48	1.05	2.22	1.47	0.00	2.22	1.48	2.22	1.48	0.00
FINAL ATTAINMENT	1.53	1.53	1.76	1.17	0.00	1.18	0.82	1.76	1.17	0.00	1.76	1.18	1.76	1.18	0.00
% OF Attainment	58.7	58.7	58.8	58.7	0.0	58.8	58.9	58.8	58.7	0.0	58.8	58.8	58.8	58.8	0.0

17ME54-DEM1-B

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

ESTD : 2001 An Institution with a Difference

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2017
SESSION	Dec-Jan-2017
SUBJECT	DME-I
SEMESTER	5
SUB CODE	17ME54

CLASS STRENGTH	52
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	40%
WEIGHTAGE FOR SEMESTER END EXAMINATION	60%

Internal Marks Weightage	
Tests IA	Quiz + Assign
100%	0%

CO PO Mapping : At the end of the course the student will be able to	
CO1	Describe the design process, choose materials and Apply the codes and standards in design process.
CO2	Analyze the behavior of machine components under static, impact, fatigue loading using failure theories
CO3	Design shafts, joints, couplings.
CO4	Design of riveted and welded joints.
CO5	Design of threaded fasteners and power screws

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17ME54.1	CO1	1	1	3			2	3	3	0		3	2	3	2			
C17ME54.2	CO2	3	3	3	2		2	1	3	2		3	2	3	2			
C17ME54.3	CO3	3	3	3	2		2	1	3	2		3	2	3	2			
C17ME54.4	CO4	3	3	3	2		2	1	3	2		3	2	3	2			
C17ME54.5	CO5	3	3	3	2		2	1	3	2		3	2	3	2			
CO - PO LEVEL		2.6	2.6	3.0	2.0	0.0	2.0	1.4	3.0	2.0	0.0	3.0	2.0	3.0	2.0	0.0		

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	27	52%
CO2	27	52%
CO3	27	52%
CO4	27	52%
CO5	27	52%

Targets for SEE			Targets for InA		
ABOVE	60%	3	75%	3	
ABOVE	50%	2	60%	2	
ABOVE	45%	1	45%	1	

COURSE OUTCOMES	CO ATTAINMENT LEVEL IA		SEE		FINAL		INDIRECT		TA	
CO1	52%	1	58%	2	57%	1.6	77%	3	59%	1.7
CO2	52%	1	58%	2	57%	1.6	74%	2	58%	1.6
CO3	52%	1	58%	2	57%	1.6	75%	3	58%	1.7
CO4	52%	1	58%	2	57%	1.6	71%	2	58%	1.6
CO5	52%	1	58%	2	57%	1.6	73%	2	58%	1.6

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17ME54.1	CO1	0.52	0.52	1.56	0.00	0.00	1.04	1.56	1.56	0.00	0.00	1.56	1.04	1.56	1.04	0.00		
C17ME54.2	CO2	1.56	1.56	1.56	1.04	0.00	1.04	0.52	1.56	1.04	0.00	1.56	1.04	1.56	1.04	0.00		
C17ME54.3	CO3	1.56	1.56	1.56	1.04	0.00	1.04	0.52	1.56	1.04	0.00	1.56	1.04	1.56	1.04	0.00		
C17ME54.4	CO4	1.56	1.56	1.56	1.04	0.00	1.04	0.52	1.56	1.04	0.00	1.56	1.04	1.56	1.04	0.00		
C17ME54.5	CO5	1.56	1.56	1.56	1.04	0.00	1.04	0.52	1.56	1.04	0.00	1.56	1.04	1.56	1.04	0.00		
DIRECT ATTAINMENT		1.35	1.35	1.56	1.04	0.00	1.04	0.73	1.56	1.04	0.00	1.56	1.04	1.56	1.04	0.00		

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
SEMESTER END EXAMINATION	1.50	1.50	1.73	1.15	0.00	1.15	0.81	1.73	1.15	0.00	1.73	1.15	1.73	1.15	0.00		
ASSIGNMENT AND QUIZ\	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
CONTINUOUS INTERNAL EVALUATION	1.35	1.35	1.56	1.04	0.00	1.04	0.73	1.56	1.04	0.00	1.56	1.04	1.56	1.04	0.00		
FINAL DIRECT ATTAINMENT	1.44	1.44	1.66	1.11	0.00	1.11	0.78	1.66	1.11	0.00	1.66	1.11	1.66	1.11	0.00		

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
FINAL DIRECT ATTAINMENT	1.44	1.44	1.66	1.11	0.00	1.11	0.78	1.66	1.11	0.00	1.66	1.11	1.66	1.11	0.00		
PROGRAM EXIT SURVEY	1.33	1.03	1.19	2.22	1.04	0.00	0.00	0.00	2.22	2.22	1.48	1.11	1.78	1.04	1.04		
FINAL ATTAINMENT	1.43	1.40	1.61	1.22	0.10	1.00	0.70	1.50	1.22	0.22	1.64	1.11	1.67	1.10	0.10		

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	GP

BATCH	2019-20
SESSION	August 2019 To December 2019
SUBJECT	Design of Machine Elements -I
SEMESTER	5C
SUB CODE	17ME54

CLASS STRENGTH	51
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Describe the design process, choose materials and Apply the codes and standards in design process.
CO2	Analyze the behavior of machine components under static, impact, fatigue loading using failure theories
CO3	Design shafts, joints, couplings.
CO4	Design of riveted and welded joints.
CO5	Design of threaded fasteners and power screws

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME54.1	CO1	1	1	3	0	0	2	3	3	0	0	3	2	3	2	0
C17ME54.2	CO2	3	3	3	2	0	2	1	3	2	0	3	2	3	2	0
C17ME54.3	CO3	3	3	3	2	0	2	1	3	2	0	3	2	3	2	0
C17ME54.4	CO4	3	3	3	2	0	2	1	3	2	0	3	2	3	2	0
C17ME54.5	CO5	3	3	3	2	0	2	1	3	2	0	3	2	3	2	0
CO - PO LEVEL		2.6	2.6	3.0	2.0	0.0	2.0	1.4	3.0	2.0	0.0	3.0	2.0	3.0	2.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			S E E	Final Direct C O % Attainment
Target>=60				
CO1	18	90.00%	54%	61%
CO2	32	62.75%	54%	55%
CO3	24	82.76%	54%	59%
CO4	43	86.00%	54%	60%
CO5	39	76.47%	54%	58%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	61%	2	77.1%	3	63%	2
CO2	55%	1	73.9%	2	57%	1
CO3	59%	1	75.1%	3	61%	2
CO4	60%	2	71.1%	2	61%	2
CO5	58%	1	73.2%	2	60%	1

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME54.1	CO1	1.00	1.00	3.00	0.00	0.00	2.00	3.00	3.00	0.00	0.00	3.00	2.00	3.00	2.00	0.00
C17ME54.2	CO2	3.00	3.00	3.00	2.00	0.00	2.00	1.00	3.00	2.00	0.00	3.00	2.00	3.00	2.00	0.00
C17ME54.3	CO3	3.00	3.00	3.00	2.00	0.00	2.00	1.00	3.00	2.00	0.00	3.00	2.00	3.00	2.00	0.00
C17ME54.4	CO4	3.00	3.00	3.00	2.00	0.00	2.00	1.00	3.00	2.00	0.00	3.00	2.00	3.00	2.00	0.00
C17ME54.5	CO5	3.00	3.00	3.00	2.00	0.00	2.00	1.00	3.00	2.00	0.00	3.00	2.00	3.00	2.00	0.00
DIRECT ATTAINMENT		2.60	2.60	3.00	2.00	0.00	2.00	1.40	3.00	2.00	0.00	3.00	2.00	3.00	2.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.39	1.39	1.61	1.07	0.00	1.07	0.75	1.61	1.07	0.00	1.61	1.07	1.61	1.07	0.00
ASSIGNMENT AND QUIZ	0.52	0.52	0.60	0.40	0.00	0.40	0.28	0.60	0.40	0.00	0.60	0.40	0.60	0.40	0.00
CONTINUOUS INTERNAL EVALUATION	2.08	2.08	2.40	1.60	0.00	1.60	1.12	2.40	1.60	0.00	2.40	1.60	2.40	1.60	0.00
FINAL DIRECT ATTAINMENT	1.63	1.63	1.89	1.26	0.00	1.26	0.88	1.89	1.26	0.00	1.89	1.26	1.89	1.26	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.63	1.63	1.89	1.26	0.00	1.26	0.88	1.89	1.26	0.00	1.89	1.26	1.89	1.26	0.00
COURSE EXIT SURVEY	1.91	1.91	2.22	1.47	0.00	1.48	1.05	2.22	1.47	0.00	2.22	1.48	2.22	1.48	0.00
FINAL ATTAINMENT	1.66	1.66	1.92	1.28	0.00	1.28	0.90	1.92	1.28	0.00	1.92	1.28	1.92	1.28	0.00
% OF Attainment	64.0	64.0	64.0	63.9	0.0	64.0	64.1	64.0	63.9	0.0	64.0	64.0	64.0	64.0	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	GRJ

BATCH	2018 -2019
SESSION	August 2018 To December 2018
SUBJECT	Non Traditional Machining.
SEMESTER	5B
SUB CODE	17ME554

CLASS STRENGTH	85
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand the compare traditional and non-traditional machining processand recognize the need for Non-traditional machining process.
CO2	Understand the constructional features, performance parameters, process characteristics, applications, advantages and limitations of USM, AJM and WJM.
CO3	Identify the need of Chemical and electro-chemical machining process along with the constructional features, process parameters, process characteristics, applications, advantages and limitations.
CO4	Understand the constructional feature of the equipment, process parameters, process characteristics, applications, advantages and limitations EDM & PAM.
CO5	Understand the LBM equipment, LBM parameters, and characteristics. EBM equipment and mechanism of metal removal, applications, advantages and limitations LBM & EBM

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME554.1	CO1	3	0	0	0	0	1	0	2	0	2	0	2	1	0	1
C17ME554.2	CO2	3	0	0	0	1	2	1	2	0	2	0	2	1	0	1
C17ME554.3	CO3	3	0	0	0	1	2	1	2	0	2	0	2	1	0	1
C17ME554.4	CO4	3	0	0	0	1	1	1	2	0	2	0	2	1	0	1
C17ME554.5	CO5	3	0	0	0	1	1	1	2	0	2	0	2	1	0	1
CO - PO LEVEL		3.0	0.0	0.0	0.0	1.0	1.4	1.0	2.0	0.0	2.0	0.0	2.0	1.0	0.0	1.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	84	98.82%	93%	94%
CO2	76	89.41%	93%	92%
CO3	81	96.43%	93%	94%
CO4	80	94.12%	93%	93%
CO5	77	90.59%	93%	92%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	94%	3	86.8%	3	93%	3
CO2	92%	3	87.7%	3	92%	3
CO3	94%	3	85.8%	3	93%	3
CO4	93%	3	82.9%	3	92%	3
CO5	92%	3	85.5%	3	92%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME554.1	CO1	2.96	0.00	0.00	0.00	0.00	0.99	0.00	1.98	0.00	1.98	0.00	1.98	0.99	0.00	0.99
C17ME554.2	CO2	2.68	0.00	0.00	0.00	0.89	1.79	0.89	1.79	0.00	1.79	0.00	1.79	0.89	0.00	0.89
C17ME554.3	CO3	2.89	0.00	0.00	0.00	0.96	1.93	0.96	1.93	0.00	1.93	0.00	1.93	0.96	0.00	0.96
C17ME554.4	CO4	2.82	0.00	0.00	0.00	0.94	0.94	0.94	1.88	0.00	1.88	0.00	1.88	0.94	0.00	0.94
C17ME554.5	CO5	2.72	0.00	0.00	0.00	0.91	0.91	0.91	1.81	0.00	1.81	0.00	1.81	0.91	0.00	0.91
DIRECT ATTAINMENT		2.82	0.00	0.00	0.00	0.93	1.31	0.93	1.88	0.00	1.88	0.00	1.88	0.94	0.00	0.94

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.79	0.00	0.00	0.00	0.93	1.30	0.93	1.86	0.00	1.86	0.00	1.86	0.93	0.00	0.93
ASSIGNMENT AND QUIZ	0.59	0.00	0.00	0.00	0.20	0.28	0.20	0.40	0.00	0.40	0.00	0.40	0.20	0.00	0.20
CONTINUOUS INTERNAL EVALUATION	2.25	0.00	0.00	0.00	0.74	1.05	0.74	1.50	0.00	1.50	0.00	1.50	0.75	0.00	0.75
FINAL DIRECT ATTAINMENT	2.80	0.00	0.00	0.00	0.93	1.31	0.93	1.87	0.00	1.87	0.00	1.87	0.93	0.00	0.93

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.80	0.00	0.00	0.00	0.93	1.31	0.93	1.87	0.00	1.87	0.00	1.87	0.93	0.00	0.93
COURSE EXIT SURVEY	2.57	0.00	0.00	0.00	0.03	0.04	0.03	0.05	0.00	0.05	0.00	0.05	0.03	0.00	0.03
FINAL ATTAINMENT	2.78	0.00	0.00	0.00	0.84	1.18	0.84	1.68	0.00	1.68	0.00	1.68	0.84	0.00	0.84
% OF Attainment	92.6	0.0	0.0	0.0	84.1	84.2	84.1	84.2	0.0	84.2	0.0	84.2	84.2	0.0	84.2

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	SH

BATCH	2019 -2020
SESSION	August 2019 To December 2019
SUBJECT	Non Traditional Machining
SEMESTER	5C
SUB CODE	17ME554

CLASS STRENGTH	47
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand the compare traditional and non-traditional machining processand recognize the need for Non-traditional machining process.
CO2	Understand the constructional features, performance parameters, process characteristics, applications, advantages and limitations of USM, AJM and WJM
CO3	Identify the need of Chemical and electro-chemical machining process along with the constructional features, process parameters, process characteristics, applications, advantages and limitations.
CO4	Understand the constructional feature of the equipment, process parameters, process characteristics, applications, advantages and limitations EDM & PAM.
CO5	Understand the LBM equipment, LBM parameters, and characteristics. EBM equipment and mechanism of metal removal, applications, advantages and limitations LBM & EBM.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME554.1	CO1	3	0	0	0	0	1	0	2	0	2	0	2	1	0	1
C17ME554.2	CO2	3	0	0	0	1	2	1	2	0	2	0	2	1	0	1
C17ME554.3	CO3	3	0	0	0	1	2	1	2	0	2	0	2	1	0	1
C17ME554.4	CO4	3	0	0	0	1	1	1	2	0	2	0	2	1	0	1
C17ME554.5	CO5	3	0	0	0	1	1	1	2	0	2	0	2	1	0	1
CO - PO LEVEL		3.0	0.0	0.0	0.0	1.0	1.4	1.0	2.0	0.0	2.0	0.0	2.0	1.0	0.0	1.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	47	100.00%	99%	99%
CO2	41	87.23%	99%	97%
CO3	46	97.87%	99%	99%
CO4	46	97.87%	99%	99%
CO5	41	87.23%	99%	97%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	99%	3	86.8%	3	98%	3
CO2	97%	3	87.7%	3	96%	3
CO3	99%	3	85.8%	3	97%	3
CO4	99%	3	82.9%	3	97%	3
CO5	97%	3	85.5%	3	95%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME554.1	CO1	3.00	0.00	0.00	0.00	0.00	1.00	0.00	2.00	0.00	2.00	0.00	2.00	1.00	0.00	1.00
C17ME554.2	CO2	2.62	0.00	0.00	0.00	0.87	1.74	0.87	1.74	0.00	1.74	0.00	1.74	0.87	0.00	0.87
C17ME554.3	CO3	2.94	0.00	0.00	0.00	0.98	1.96	0.98	1.96	0.00	1.96	0.00	1.96	0.98	0.00	0.98
C17ME554.4	CO4	2.94	0.00	0.00	0.00	0.98	0.98	0.98	1.96	0.00	1.96	0.00	1.96	0.98	0.00	0.98
C17ME554.5	CO5	2.62	0.00	0.00	0.00	0.87	0.87	0.87	1.74	0.00	1.74	0.00	1.74	0.87	0.00	0.87
DIRECT ATTAINMENT		2.82	0.00	0.00	0.00	0.93	1.31	0.93	1.88	0.00	1.88	0.00	1.88	0.94	0.00	0.94

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.97	0.00	0.00	0.00	0.99	1.39	0.99	1.98	0.00	1.98	0.00	1.98	0.99	0.00	0.99
ASSIGNMENT AND QUIZ	0.60	0.00	0.00	0.00	0.20	0.28	0.20	0.40	0.00	0.40	0.00	0.40	0.20	0.00	0.20
CONTINUOUS INTERNAL EVALUATION	2.26	0.00	0.00	0.00	0.74	1.05	0.74	1.50	0.00	1.50	0.00	1.50	0.75	0.00	0.75
FINAL DIRECT ATTAINMENT	2.95	0.00	0.00	0.00	0.98	1.37	0.98	1.96	0.00	1.96	0.00	1.96	0.98	0.00	0.98

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.95	0.00	0.00	0.00	0.98	1.37	0.98	1.96	0.00	1.96	0.00	1.96	0.98	0.00	0.98
COURSE EXIT SURVEY	2.57	0.00	0.00	0.00	0.85	1.20	0.85	1.72	0.00	1.72	0.00	1.72	0.86	0.00	0.86
FINAL ATTAINMENT	2.91	0.00	0.00	0.00	0.97	1.36	0.97	1.94	0.00	1.94	0.00	1.94	0.97	0.00	0.97
% OF Attainment	97.0	0.0	0.0	0.0	96.7	96.9	96.7	97.0	0.0	97.0	0.0	97.0	97.0	0.0	97.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	RG

BATCH	2019 -2020
SESSION	February 2019 - May 2019
SUBJECT	AAR
SEMESTER	5A,B,C
SUB CODE	15ME563

CLASS STRENGTH	54
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	40
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	To identify potential areas for automation and justify need for automation.
CO2	To select suitable major control components required to automate a process or an activity
CO3	To study the various parts of robots and fields of robotics.
CO4	To study the various kinematics and inverse kinematics of robots.
CO5	To study the control of robots for some specific applications.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C15ME563.1	CO1	3	1	0	0	0	1	2	1	0	1	0	2	1	0	2
C15ME563.2	CO2	3	3	2	0	0	0	2	1	0	1	0	1	1	0	2
C15ME563.3	CO3	2	2	0	0	0	2	0	1	0	1	0	2	1	0	2
C15ME563.4	CO4	2	1	0	0	0	2	0	1	0	1	0	1	1	0	2
C15ME563.5	CO5	2	1	0	0	0	0	0	1	0	1	0	1	1	0	2
CO - PO LEVEL		2.4	1.6	2.0	0.0	0.0	1.7	2.0	1.0	0.0	1.0	0.0	1.4	1.0	0.0	2.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			S E E	Final Direct C O % Attainment
CO1	50	90.91%	100%	98%
CO2	43	81.13%	100%	96%
CO3	54	98.18%	100%	100%
CO4	44	80.00%	100%	96%
CO5	47	85.45%	100%	97%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	98%	3	86.8%	3	97%	3
CO2	96%	3	87.7%	3	95%	3
CO3	100%	3	85.8%	3	98%	3
CO4	96%	3	82.9%	3	95%	3
CO5	97%	3	85.5%	3	96%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C15ME563.1	CO1	2.73	0.91	0.00	0.00	0.00	0.91	1.82	0.91	0.00	0.91	0.00	1.82	0.91	0.00	1.82
C15ME563.2	CO2	2.43	2.43	1.62	0.00	0.00	0.00	1.62	0.81	0.00	0.81	0.00	0.81	0.81	0.00	1.62
C15ME563.3	CO3	1.96	1.96	0.00	0.00	0.00	1.96	0.00	0.98	0.00	0.98	0.00	1.96	0.98	0.00	1.96
C15ME563.4	CO4	1.60	0.80	0.00	0.00	0.00	1.60	0.00	0.80	0.00	0.80	0.00	0.80	0.80	0.00	1.60
C15ME563.5	CO5	1.71	0.85	0.00	0.00	0.00	0.00	0.00	0.85	0.00	0.85	0.00	0.85	0.85	0.00	1.71
DIRECT ATTAINMENT		2.09	1.39	1.62	0.00	0.00	1.49	1.72	0.87	0.00	0.87	0.00	1.25	0.87	0.00	1.74

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.40	1.60	2.00	0.00	0.00	1.67	2.00	1.00	0.00	1.00	0.00	1.40	1.00	0.00	2.00
ASSIGNMENT AND QUIZ	0.48	0.32	0.40	0.00	0.00	0.33	0.40	0.20	0.00	0.20	0.00	0.28	0.20	0.00	0.40
CONTINUOUS INTERNAL EVALUATION	1.67	1.11	1.30	0.00	0.00	1.19	1.38	0.70	0.00	0.70	0.00	1.00	0.70	0.00	1.39
FINAL DIRECT ATTAINMENT	2.35	1.57	1.94	0.00	0.00	1.64	1.96	0.98	0.00	0.98	0.00	1.38	0.98	0.00	1.96

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.35	1.57	1.94	0.00	0.00	1.64	1.96	0.98	0.00	0.98	0.00	1.38	0.98	0.00	1.96
COURSE EXIT SURVEY	2.06	1.38	1.75	0.00	0.00	1.41	1.75	0.86	0.00	0.86	0.00	1.20	0.86	0.00	1.72
FINAL ATTAINMENT	2.32	1.55	1.92	0.00	0.00	1.62	1.94	0.97	0.00	0.97	0.00	1.36	0.97	0.00	1.94
% OF Attainment	96.8	96.8	96.1	0.0	0.0	97.1	96.8	96.8	0.0	96.8	0.0	97.1	96.8	0.0	96.8

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

ESTD : 2001 An Institution with a Difference

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2017
SESSION	Aug - Dec 2019
SUBJECT	OOPS
SEMESTER	5
SUB CODE	17CS562

CLASS STRENGTH	10
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage	
Tests IA	Quiz + Assign
100%	0%

CO PO Mapping : At the end of the course the student will be able to	
CO1	
CO2	
CO3	
CO4	
CO5	

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17CS562.1	CO1	3							1				2	3				
C17CS562.2	CO2	3	2						1				2	3				
C17CS562.3	CO3	3						3	2				2	3				
C17CS562.4	CO4	3						3	2				2	2				
C17CS562.5	CO5	2						3	2				2	2				
CO - PO LEVEL		2.8	2.0	0.0	0.0	0.0	0.0	3.0	1.6	0.0	0.0	0.0	2.0	2.6	0.0	0.0		

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
3	Substantially related	
2	Moderately related	
1	Slightly related	

INTERNAL ASSESSMENT		
Target>=60		
CO1	8	80%
CO2	8	80%
CO3	8	80%
CO4	8	80%
CO5	8	80%

Targets for SEE			Targets for InA		
ABOVE	60%	3	75%	3	
ABOVE	50%	2	60%	2	
ABOVE	45%	1	45%	1	

COURSE OUTCOMES	CO ATTAINMENT LEVEL IA		SEE		FINAL		INDIRECT		TA	
CO1	80%	3	60%	3	64%	3	80%	3	66%	3
CO2	80%	3	60%	3	64%	3	77%	3	65%	3
CO3	80%	3	60%	3	64%	3	74%	2	65%	3
CO4	80%	3	60%	3	64%	3	74%	2	65%	3
CO5	80%	3	60%	3	64%	3	78%	3	65%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17CS562.1	CO1	2.40	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	1.60	2.40	0.00	0.00		
C17CS562.2	CO2	2.40	1.60	0.00	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	1.60	2.40	0.00	0.00		
C17CS562.3	CO3	2.40	0.00	0.00	0.00	0.00	0.00	2.40	1.60	0.00	0.00	0.00	1.60	2.40	0.00	0.00		
C17CS562.4	CO4	2.40	0.00	0.00	0.00	0.00	0.00	2.40	1.60	0.00	0.00	0.00	1.60	1.60	0.00	0.00		
C17CS562.5	CO5	1.60	0.00	0.00	0.00	0.00	0.00	2.40	1.60	0.00	0.00	0.00	1.60	1.60	0.00	0.00		
DIRECT ATTAINMENT		2.24	1.60	0.00	0.00	0.00	0.00	2.40	1.28	0.00	0.00	0.00	1.60	2.08	0.00	0.00		

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
SEMESTER END EXAMINATION	1.68	1.20	0.00	0.00	0.00	0.00	1.80	0.96	0.00	0.00	0.00	1.20	1.56	0.00	0.00		
ASSIGNMENT AND QUIZ\	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
CONTINUOUS INTERNAL EVALUATION	2.24	1.60	0.00	0.00	0.00	0.00	2.40	1.28	0.00	0.00	0.00	1.60	2.08	0.00	0.00		
FINAL DIRECT ATTAINMENT	1.79	1.28	0.00	0.00	0.00	0.00	1.92	1.02	0.00	0.00	0.00	1.28	1.66	0.00	0.00		

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
FINAL DIRECT ATTAINMENT	1.79	1.28	0.00	0.00	0.00	0.00	1.92	1.02	0.00	0.00	0.00	1.28	1.66	0.00	0.00		
PROGRAM EXIT SURVEY	2.15	1.55	0.00	0.00	0.00	0.00	2.27	1.22	0.00	0.00	0.00	1.54	2.00	0.00	0.00		
FINAL ATTAINMENT	1.83	1.31	0.00	0.00	0.00	0.00	1.95	1.04	0.00	0.00	0.00	1.31	1.70	0.00	0.00		

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2017
SESSION	Aug - Dec 2019
SUBJECT	TOE
SEMESTER	5
SUB CODE	17ME552

CLASS STRENGTH	21
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage	
Tests IA	Quiz + Assign
100%	0%

CO PO Mapping : At the end of the course the student will be able to

CO 1	Understand various types of stresses induced in machine elements under different types of loads.
CO 2	Comprehend various types of strains induced in machine elements under different types of loads.
CO 3	Analyze the structural members: beams, rotating disks.
CO 4	Analyze the torsional rigidity of circular and non-circular sections.
CO 5	Analyze the stability of columns and elastic members subjected to thermal loads.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17ME552.1	CO1	3	2	0	0	0	0	0	0	1	1	0	1	1	1	0		
C17ME552.2	CO2	3	2	0	0	0	0	0	0	1	1	0	1	1	1	0		
C17ME552.3	CO3	3	2	2	1	0	0	0	0	1	0	0	1	1	1	0		
C17ME552.4	CO4	3	2	2	1	0	0	0	1	1	0	0	1	1	1	1		
C17ME552.5	CO5	3	2	2	1	0	0	0	1	1	0	0	1	1	1	1		
CO - PO LEVEL		3.0	2.0	2.0	1.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0		

INTERNAL ASSESSMENT		
Target>=60		
CO 1	19	90%
CO 2	19	90%
CO 3	19	90%
CO 4	19	90%
CO 5	19	90%

Targets for SEE			Targets for InA		
ABOVE	60%	3		75%	3
ABOVE	50%	2		60%	2
ABOVE	45%	1		45%	1

COURSE OUTCOMES	CO ATTAINMENT LEVEL						INDIRECT		TA	
	IA		SEE		FINAL					
CO1	90%	3	86%	3	87%	3	80%	3	86%	3
CO2	90%	3	86%	3	87%	3	77%	3	86%	3
CO3	90%	3	86%	3	87%	3	74%	2	85%	3
CO4	90%	3	86%	3	87%	3	74%	2	85%	3
CO5	90%	3	86%	3	87%	3	78%	3	86%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17ME552.1	CO1	2.71	1.81	0.00	0.00	0.00	0.00	0.00	0.00	0.90	0.90	0.00	0.90	0.90	0.90	0.00		
C17ME552.2	CO2	2.71	1.81	0.00	0.00	0.00	0.00	0.00	0.00	0.90	0.90	0.00	0.90	0.90	0.90	0.00		
C17ME552.3	CO3	2.71	1.81	1.81	0.90	0.00	0.00	0.00	0.00	0.90	0.00	0.00	0.90	0.90	0.90	0.00		
C17ME552.4	CO4	2.71	1.81	1.81	0.90	0.00	0.00	0.00	0.90	0.90	0.00	0.00	0.90	0.90	0.90	0.90		
C17ME552.5	CO5	2.71	1.81	1.81	0.90	0.00	0.00	0.00	0.90	0.90	0.00	0.00	0.90	0.90	0.90	0.90		
DIRECT ATTAINMENT		2.71	1.81	1.81	0.90	0.00	0.00	0.00	0.90	0.90	0.90	0.00	0.90	0.90	0.90	0.90		

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
SEMESTER END EXAMINATION	2.57	1.71	1.71	0.86	0.00	0.00	0.00	0.86	0.86	0.86	0.00	0.86	0.86	0.86	0.86		
ASSIGNMENT AND QUIZ\	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
CONTINUOUS INTERNAL EVALUATION	2.71	1.81	1.81	0.90	0.00	0.00	0.00	0.90	0.90	0.90	0.00	0.90	0.90	0.90	0.90		
FINAL DIRECT ATTAINMENT	2.60	1.73	1.73	0.87	0.00	0.00	0.00	0.87	0.87	0.87	0.00	0.87	0.87	0.87	0.87		

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
FINAL DIRECT ATTAINMENT	2.60	1.73	1.73	0.87	0.00	0.00	0.00	0.87	0.87	0.87	0.00	0.87	0.87	0.87	0.87		
PROGRAM EXIT SURVEY	2.31	1.54	1.51	0.76	0.00	0.00	0.00	0.76	0.77	0.79	0.00	0.77	0.77	0.77	0.76		
FINAL ATTAINMENT	2.57	1.71	1.71	0.86	0.00	0.00	0.00	0.86	0.86	0.86	0.00	0.86	0.86	0.86	0.86		

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

ESTD : 2001 An Institution with a Difference

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2017
SESSION	Aug - Dec 2019
SUBJECT	E&E
SEMESTER	5
SUB CODE	17ME562

CLASS STRENGTH	89
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage	
Tests IA	Quiz + Assign
100%	0%

CO PO Mapping : At the end of the course the student will be able to

CO1	Understand the basic concepts of energy, sources of energy, its distribution, world energy production & distribution and key energy trends in India.
CO2	Interpret different energy storage systems, energy management, perform energy audit and economic analysis
CO3	Understand the role of environment, eco system and need for environmental awareness.
CO4	Interpret the various types of environment pollution and their effects on human beings
CO5	Summarize the social issues of the environment with associated acts.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17ME562.1	CO1	3							1				2	3				
C17ME562.2	CO2	3	2						1				2	3				
C17ME562.3	CO3	3						3	2				2	3				
C17ME562.4	CO4	3						3	2				2	2				
C17ME562.5	CO5	2						3	2				2	2				
CO - PO LEVEL		2.8	2.0	0.0	0.0	0.0	0.0	3.0	1.6	0.0	0.0	0.0	2.0	2.6	0.0	0.0		

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	76	85%
CO2	76	85%
CO3	76	85%
CO4	76	85%
CO5	76	85%

Targets for SEE			Targets for InA		
ABOVE	60%	3	75%	3	
ABOVE	50%	2	60%	2	
ABOVE	45%	1	45%	1	

COURSE OUTCOMES	CO ATTAINMENT LEVEL IA		SEE		FINAL		INDIRECT		TA	
CO1	85%	3	87%	3	86%	3	80%	3	86%	3
CO2	85%	3	87%	3	86%	3	77%	3	85%	3
CO3	85%	3	87%	3	86%	3	74%	2	85%	3
CO4	85%	3	87%	3	86%	3	74%	2	85%	3
CO5	85%	3	87%	3	86%	3	78%	3	86%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17ME562.1	CO1	2.56	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.00	0.00	0.00	1.71	2.56	0.00	0.00		
C17ME562.2	CO2	2.56	1.71	0.00	0.00	0.00	0.00	0.00	0.85	0.00	0.00	0.00	1.71	2.56	0.00	0.00		
C17ME562.3	CO3	2.56	0.00	0.00	0.00	0.00	0.00	2.56	1.71	0.00	0.00	0.00	1.71	2.56	0.00	0.00		
C17ME562.4	CO4	2.56	0.00	0.00	0.00	0.00	0.00	2.56	1.71	0.00	0.00	0.00	1.71	1.71	0.00	0.00		
C17ME562.5	CO5	1.71	0.00	0.00	0.00	0.00	0.00	2.56	1.71	0.00	0.00	0.00	1.71	1.71	0.00	0.00		
DIRECT ATTAINMENT		2.39	1.71	0.00	0.00	0.00	0.00	2.56	1.37	0.00	0.00	0.00	1.71	2.22	0.00	0.00		

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
SEMESTER END EXAMINATION	2.42	1.73	0.00	0.00	0.00	0.00	2.60	1.38	0.00	0.00	0.00	1.73	2.25	0.00	0.00		
ASSIGNMENT AND QUIZ\	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
CONTINUOUS INTERNAL EVALUATION	2.39	1.71	0.00	0.00	0.00	0.00	2.56	1.37	0.00	0.00	0.00	1.71	2.22	0.00	0.00		
FINAL DIRECT ATTAINMENT	2.42	1.73	0.00	0.00	0.00	0.00	2.59	1.38	0.00	0.00	0.00	1.73	2.24	0.00	0.00		

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
FINAL DIRECT ATTAINMENT	2.42	1.73	0.00	0.00	0.00	0.00	2.59	1.38	0.00	0.00	0.00	1.73	2.24	0.00	0.00		
PROGRAM EXIT SURVEY	2.15	1.55	0.00	0.00	0.00	0.00	2.27	1.22	0.00	0.00	0.00	1.54	2.00	0.00	0.00		
FINAL ATTAINMENT	2.39	1.71	0.00	0.00	0.00	0.00	2.56	1.36	0.00	0.00	0.00	1.71	2.22	0.00	0.00		

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	DrTKC

BATCH	2019-2020
SESSION	AUG 2019To DEC 2019
SUBJECT	FM LAB
SEMESTER	5
SUB CODE	17MEL57

CLASS STRENGTH	154
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
100%	0%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	To calibrate different flow measuring devices.
CO2	To estimate head losses in pipes and force developed by impact of jet on vanes.
CO3	To conduct performance tests on power generating turbo machines-Impulse turbine.
CO4	To carry out performance tests on power absorbing turbo machines and positive displacement machine.
CO5	To conduct performance tests on power generating turbo machines-Reaction turbine

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MEL57.1	CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEL57.2	CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEL57.3	CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEL57.4	CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEL57.5	CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO - PO LEVEL		2.0	3.0	3.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	2.0	1.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct C O % Attainment
Target>=60				
CO1	151	98.69%	99%	99%
CO2	151	98.69%	99%	99%
CO3	151	98.69%	99%	99%
CO4	151	98.69%	99%	99%
CO5	151	98.69%	99%	99%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	99%	3	78.5%	3	97%	3
CO2	99%	3	82.5%	3	97%	3
CO3	99%	3	85.5%	3	97%	3
CO4	99%	3	82.7%	3	97%	3
CO5	99%	3	80.7%	3	97%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MEL57.1	CO1	1.97	2.96	2.96	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	1.97	0.99	0.00	0.00
C17MEL57.2	CO2	1.97	2.96	2.96	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	1.97	0.99	0.00	0.00
C17MEL57.3	CO3	1.97	2.96	2.96	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	1.97	0.99	0.00	0.00
C17MEL57.4	CO4	1.97	2.96	2.96	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	1.97	0.99	0.00	0.00
C17MEL57.5	CO5	1.97	2.96	2.96	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	1.97	0.99	0.00	0.00
DIRECT ATTAINMENT		1.97	2.96	2.96	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	1.97	0.99	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.97	2.96	2.96	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	1.97	0.99	0.00	0.00
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	1.97	2.96	2.96	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	1.97	0.99	0.00	0.00
FINAL DIRECT ATTAINMENT	1.97	2.96	2.96	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	1.97	0.99	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.97	2.96	2.96	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	1.97	0.99	0.00	0.00
COURSE EXIT SURVEY	1.64	2.46	2.46	0.00	0.00	0.00	0.00	0.82	0.00	0.82	0.00	1.64	0.82	0.00	0.00
FINAL ATTAINMENT	1.94	2.91	2.91	0.00	0.00	0.00	0.00	0.97	0.00	0.97	0.00	1.94	0.97	0.00	0.00
% OF Attainment	97.0	97.0	97.0	0.0	0.0	0.0	0.0	97.0	0.0	97.0	0.0	97.0	97.0	0.0	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	0

BATCH	2019-2020
SESSION	AUG 2019To DEC 2019
SUBJECT	EC LAB
SEMESTER	5
SUB CODE	17MEL58

CLASS STRENGTH	154
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
100%	0%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Analyze and Perform experiments to determine the properties of fuels and various grades oils.
CO2	Analyze and Conduct experiments on engines to draw characteristics curves. Test basic performance parameters of I.C. Engine and implement the knowledge in industry
CO3	Determine the energy flow pattern through the I C Engine and identify exhaust emission, factors affecting them and report the remedies.
CO4	Exhibit his competency towards preventive maintenance of stroke2 IC engines.
CO5	Exhibit his competency towards preventive maintenance of 4 stroke IC engines

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MEL58.1	CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEL58.2	CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEL58.3	CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEL58.4	CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17MEL58.5	CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO - PO LEVEL		2.0	3.0	3.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	2.0	1.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	149	97.39%	96%	96%
CO2	149	97.39%	96%	96%
CO3	149	97.39%	96%	96%
CO4	149	97.39%	96%	96%
CO5	149	97.39%	96%	96%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	96%	3	81.9%	3	95%	3
CO2	96%	3	81.9%	3	95%	3
CO3	96%	3	79.5%	3	95%	3
CO4	96%	3	79.9%	3	95%	3
CO5	96%	3	83.5%	3	95%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MEL58.1	CO1	1.95	2.92	2.92	0.00	0.00	0.00	0.00	0.97	0.00	0.97	0.00	1.95	0.97	0.00	0.00
C17MEL58.2	CO2	1.95	2.92	2.92	0.00	0.00	0.00	0.00	0.97	0.00	0.97	0.00	1.95	0.97	0.00	0.00
C17MEL58.3	CO3	1.95	2.92	2.92	0.00	0.00	0.00	0.00	0.97	0.00	0.97	0.00	1.95	0.97	0.00	0.00
C17MEL58.4	CO4	1.95	2.92	2.92	0.00	0.00	0.00	0.00	0.97	0.00	0.97	0.00	1.95	0.97	0.00	0.00
C17MEL58.5	CO5	1.95	2.92	2.92	0.00	0.00	0.00	0.00	0.97	0.00	0.97	0.00	1.95	0.97	0.00	0.00
DIRECT ATTAINMENT		1.95	2.92	2.92	0.00	0.00	0.00	0.00	0.97	0.00	0.97	0.00	1.95	0.97	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.92	2.88	2.88	0.00	0.00	0.00	0.00	0.96	0.00	0.96	0.00	1.92	0.96	0.00	0.00
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	1.95	2.92	2.92	0.00	0.00	0.00	0.00	0.97	0.00	0.97	0.00	1.95	0.97	0.00	0.00
FINAL DIRECT ATTAINMENT	1.93	2.89	2.89	0.00	0.00	0.00	0.00	0.96	0.00	0.96	0.00	1.93	0.96	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.93	2.89	2.89	0.00	0.00	0.00	0.00	0.96	0.00	0.96	0.00	1.93	0.96	0.00	0.00
COURSE EXIT SURVEY	1.63	2.44	2.44	0.00	0.00	0.00	0.00	0.81	0.00	0.81	0.00	1.63	0.81	0.00	0.00
FINAL ATTAINMENT	1.90	2.85	2.85	0.00	0.00	0.00	0.00	0.95	0.00	0.95	0.00	1.90	0.95	0.00	0.00
% OF Attainment	94.9	94.9	94.9	0.0	0.0	0.0	0.0	94.9	0.0	94.9	0.0	94.9	94.9	0.0	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	RB

BATCH	2019-2020
SESSION	February 2019 To May 2019
SUBJECT	Finite Element Analysis
SEMESTER	6
SUB CODE	17ME61

CLASS STRENGTH	51
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand the concepts of plane stresses and plane strains and basic procedure of FEM. Write an interpolation polynomial for linear, quadratic and cubic elements
CO2	Derive the shape functions and to determine the displacements, reactions and stresses in bars and Trusses by using penalty and elimination approach. Also to analyse the higher order Elements
CO3	Determine the deflection of cantilever, Simply Supported and Fixed Beam. Also to determine the angle of twist in Shafts
CO4	Analyse the temperature distribution applying the boundary conditions like conduction and convection. Also to analyse the flow through pipes of uniform and stepped sections
CO5	Analyse the axisymmetric bodies with triangular elements. Also to Analyse the point mass and limped mass matrix for bar and Truss elements

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME61.1	CO1	3	2	0	0	0	0	0	1	0	0	0	1	2	1	1
C17ME61.2	CO2	3	2	1	1	0	0	0	1	0	0	0	1	2	1	2
C17ME61.3	CO3	3	2	1	1	0	0	0	1	0	0	0	1	2	2	2
C17ME61.4	CO4	3	2	1	1	1	0	0	1	0	0	0	1	2	1	2
C17ME61.5	CO5	3	2	1	0	1	0	0	1	0	0	0	1	2	1	2
CO - PO LEVEL		3.0	2.0	1.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	2.0	1.2	1.8

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	50	100.00%	96%	97%
CO2	50	100.00%	96%	97%
CO3	50	100.00%	96%	97%
CO4	50	100.00%	96%	97%
CO5	50	100.00%	96%	97%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	97%	3	65.3%	2	94%	3
CO2	97%	3	64.4%	2	94%	3
CO3	97%	3	60.2%	2	93%	3
CO4	97%	3	58.2%	1	93%	3
CO5	97%	3	59.6%	1	93%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME61.1	CO1	3.00	2.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	2.00	1.00	1.00
C17ME61.2	CO2	3.00	2.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	2.00	1.00	2.00
C17ME61.3	CO3	3.00	2.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	2.00	2.00	2.00
C17ME61.4	CO4	3.00	2.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	2.00	1.00	2.00
C17ME61.5	CO5	3.00	2.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	2.00	1.00	2.00
DIRECT ATTAINMENT		3.00	2.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	2.00	1.20	1.80

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.89	1.93	0.96	0.96	0.96	0.00	0.00	0.96	0.00	0.00	0.00	0.96	1.93	1.16	1.73
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	2.40	1.60	0.80	0.80	0.80	0.00	0.00	0.80	0.00	0.00	0.00	0.80	1.60	0.96	1.44
FINAL DIRECT ATTAINMENT	2.79	1.86	0.93	0.93	0.93	0.00	0.00	0.93	0.00	0.00	0.00	0.93	1.86	1.12	1.67

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.79	1.86	0.93	0.93	0.93	0.00	0.00	0.93	0.00	0.00	0.00	0.93	1.86	1.12	1.67
COURSE EXIT SURVEY	1.85	1.23	0.61	0.61	0.59	0.00	0.00	0.62	0.00	0.00	0.00	0.62	1.23	0.74	1.10
FINAL ATTAINMENT	2.70	1.80	0.90	0.90	0.90	0.00	0.00	0.90	0.00	0.00	0.00	0.90	1.80	1.08	1.62
% OF Attainment	89.9	89.9	89.8	89.8	89.6	0.0	0.0	89.9	0.0	0.0	0.0	89.9	89.9	89.9	89.9

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	CSB

BATCH	2019-2020
SESSION	FEB 2020T-JUNE 2020
SUBJECT	FEM
SEMESTER	6
SUB CODE	17ME61

CLASS STRENGTH	52
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand the concepts of plane stresses and plane strains and basic procedure of FEM. Write an interpolation polynomial for linear, quadratic and cubic elements and derive the shape functions.
CO2	Determine the displacements, reactions and stresses in bars and stepped bars by using penalty approach, elimination approach.
CO3	Analyze the Higher order elements, trusses beams, torsion of shafts
CO4	Analyze the temperature distribution applying the boundry conditions like conduction and convection.
CO5	Analyse the velocity flow rate of pipes and analyse the axysymmetric elements

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME61.1	CO1	3	2	0	0	0	0	0	1	0	0	0	1	2	1	1
C17ME61.2	CO2	3	2	1	1	0	0	0	1	0	0	0	1	2	1	2
C17ME61.3	CO3	3	2	1	1	0	0	0	1	0	0	0	1	2	2	2
C17ME61.4	CO4	3	2	1	1	1	0	0	1	0	0	0	1	2	1	2
C17ME61.5	CO5	3	2	1	0	1	0	0	1	0	0	0	1	2	1	2
CO - PO LEVEL		3.0	2.0	1.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	2.0	1.2	1.8

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	51	98.08%	98%	98%
CO2	51	98.08%	98%	98%
CO3	51	98.08%	98%	98%
CO4	51	98.08%	98%	98%
CO5	51	98.08%	98%	98%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	98%	3	65.3%	2	95%	3
CO2	98%	3	64.4%	2	95%	3
CO3	98%	3	60.2%	2	94%	3
CO4	98%	3	58.2%	1	94%	3
CO5	98%	3	59.6%	1	94%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME61.1	CO1	2.94	1.96	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.98	1.96	0.98	0.98
C17ME61.2	CO2	2.94	1.96	0.98	0.98	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.98	1.96	0.98	1.96
C17ME61.3	CO3	2.94	1.96	0.98	0.98	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.98	1.96	1.96	1.96
C17ME61.4	CO4	2.94	1.96	0.98	0.98	0.98	0.00	0.00	0.98	0.00	0.00	0.00	0.98	1.96	0.98	1.96
C17ME61.5	CO5	2.94	1.96	0.98	0.00	0.98	0.00	0.00	0.98	0.00	0.00	0.00	0.98	1.96	0.98	1.96
DIRECT ATTAINMENT		2.94	1.96	0.98	0.98	0.98	0.00	0.00	0.98	0.00	0.00	0.00	0.98	1.96	1.18	1.77

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.95	1.97	0.98	0.98	0.98	0.00	0.00	0.98	0.00	0.00	0.00	0.98	1.97	1.18	1.77
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	2.35	1.57	0.78	0.78	0.78	0.00	0.00	0.78	0.00	0.00	0.00	0.78	1.57	0.94	1.41
FINAL DIRECT ATTAINMENT	2.83	1.89	0.94	0.94	0.94	0.00	0.00	0.94	0.00	0.00	0.00	0.94	1.89	1.13	1.70

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.83	1.89	0.94	0.94	0.94	0.00	0.00	0.94	0.00	0.00	0.00	0.94	1.89	1.13	1.70
COURSE EXIT SURVEY	1.85	1.23	0.61	0.61	0.59	0.00	0.00	0.62	0.00	0.00	0.00	0.62	1.23	0.74	1.10
FINAL ATTAINMENT	2.73	1.82	0.91	0.91	0.91	0.00	0.00	0.91	0.00	0.00	0.00	0.91	1.82	1.09	1.64
% OF Attainment	91.0	91.0	90.9	91.0	90.8	0.0	0.0	91.0	0.0	0.0	0.0	91.0	91.0	91.0	91.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	CSB

BATCH	2019-2020
SESSION	FEB 2020T-JUNE 2020
SUBJECT	FEM
SEMESTER	6-C
SUB CODE	17ME61

CLASS STRENGTH	51
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand the concepts of plane stresses and plane strains and basic procedure of FEM. Write an interpolation polynomial for linear, quadratic and cubic elements and derive the shape functions.
CO2	Determine the displacements, reactions and stresses in bars and stepped bars by using penalty approach, elimination approach.
CO3	Analyze the Higher order elements, trusses beams, torsion of shafts
CO4	Analyze the temperature distribution applying the boundry conditions like conduction and convection.
CO5	Analyse the velocity flow rate of pipes and analyse the axysymmetric elements

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME61.1	CO1	3	2	0	0	0	0	0	1	0	0	0	1	2	1	1
C17ME61.2	CO2	3	2	1	1	0	0	0	1	0	0	0	1	2	1	2
C17ME61.3	CO3	3	2	1	1	0	0	0	1	0	0	0	1	2	2	2
C17ME61.4	CO4	3	2	1	1	1	0	0	1	0	0	0	1	2	1	2
C17ME61.5	CO5	3	2	1	0	1	0	0	1	0	0	0	1	2	1	2
CO - PO LEVEL		3.0	2.0	1.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	2.0	1.2	1.8

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	46	90.20%	100%	98%
CO2	46	90.20%	100%	98%
CO3	46	90.20%	100%	98%
CO4	46	90.20%	100%	98%
CO5	46	90.20%	100%	98%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	98%	3	65.3%	2	95%	3
CO2	98%	3	64.4%	2	95%	3
CO3	98%	3	60.2%	2	94%	3
CO4	98%	3	58.2%	1	94%	3
CO5	98%	3	59.6%	1	94%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME61.1	CO1	2.71	1.80	0.00	0.00	0.00	0.00	0.00	0.90	0.00	0.00	0.00	0.90	1.80	0.90	0.90
C17ME61.2	CO2	2.71	1.80	0.90	0.90	0.00	0.00	0.00	0.90	0.00	0.00	0.00	0.90	1.80	0.90	1.80
C17ME61.3	CO3	2.71	1.80	0.90	0.90	0.00	0.00	0.00	0.90	0.00	0.00	0.00	0.90	1.80	1.80	1.80
C17ME61.4	CO4	2.71	1.80	0.90	0.90	0.90	0.00	0.00	0.90	0.00	0.00	0.00	0.90	1.80	0.90	1.80
C17ME61.5	CO5	2.71	1.80	0.90	0.00	0.90	0.00	0.00	0.90	0.00	0.00	0.00	0.90	1.80	0.90	1.80
DIRECT ATTAINMENT		2.71	1.80	0.90	0.90	0.90	0.00	0.00	0.90	0.00	0.00	0.00	0.90	1.80	1.08	1.62

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	3.01	2.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	2.00	1.20	1.80
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	2.16	1.44	0.72	0.72	0.72	0.00	0.00	0.72	0.00	0.00	0.00	0.72	1.44	0.87	1.30
FINAL DIRECT ATTAINMENT	2.84	1.89	0.95	0.95	0.95	0.00	0.00	0.95	0.00	0.00	0.00	0.95	1.89	1.14	1.70

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.84	1.89	0.95	0.95	0.95	0.00	0.00	0.95	0.00	0.00	0.00	0.95	1.89	1.14	1.70
COURSE EXIT SURVEY	1.85	1.23	0.61	0.61	0.59	0.00	0.00	0.62	0.00	0.00	0.00	0.62	1.23	0.74	1.10
FINAL ATTAINMENT	2.74	1.83	0.91	0.91	0.91	0.00	0.00	0.91	0.00	0.00	0.00	0.91	1.83	1.10	1.64
% OF Attainment	91.3	91.3	91.2	91.2	91.0	0.0	0.0	91.3	0.0	0.0	0.0	91.3	91.3	91.3	91.3

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

ESTD : 2001 An Institution with a Difference

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2017
SESSION	Aug - Dec 2018
SUBJECT	CIM
SEMESTER	6
SUB CODE	17ME62

CLASS STRENGTH	154
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage	
Tests IA	Quiz + Assign
100%	0%

CO PO Mapping : At the end of the course the student will be able to

CO1	To impart knowledge of CIM andAutomation and different concepts of automation by developing mathematical models..
CO2	To make students to understand the Computer Applications in Design and Manufacturing [CAD / CAM) leading to Computer integrated systems. Enable them to perform various transformations of entities on display devices
CO3	To expose students to automated flow lines,assembly lines,Line Balancing Techniques,and Flexible Manufacturing Systems.
CO4	To expose students to computer aided process planning, material requirement planning, capacity planning etc.
CO5	To expose the students to CNC Machine Tools,CNC part programming, and industrial robots and • To introduce the students to concepts of Additive Manufacturing, Internet of Things, and Industry 4.0leading to Smart Factory.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17MEL62.1	CO1	1	1				1	2					2	1		2		
C17MEL62.2	CO2	3	3	2				2					1	1		2		
C17MEL62.3	CO3	2	2				2						2	1		2		
C17MEL62.4	CO4	2	1				2						1	1		2		
C17MEL62.5	CO5	2	1										1	1		2		
CO - PO LEVEL		2.0	1.6	2.0	0.0	0.0	1.7	2.0	0.0	0.0	0.0	0.0	1.4	1.0	0.0	2.0		

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	154	100%
CO2	154	100%
CO3	154	100%
CO4	154	100%
CO5	154	100%

Targets for SEE			Targets for InA		
ABOVE	60%	3	75%	3	
ABOVE	50%	2	60%	2	
ABOVE	45%	1	45%	1	

COURSE OUTCOMES	CO ATTAINMENT LEVEL IA		SEE		FINAL		INDIRECT		TA	
CO1	100%	3	99%	3	99%	3	61%	2	96%	3
CO2	100%	3	99%	3	99%	3	62%	2	96%	3
CO3	100%	3	99%	3	99%	3	62%	2	96%	3
CO4	100%	3	99%	3	99%	3	63%	2	96%	3
CO5	100%	3	99%	3	99%	3	68%	2	96%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17MEL62.1	CO1	1.00	1.00	0.00	0.00	0.00	1.00	2.00	0.00	0.00	0.00	0.00	2.00	1.00	0.00	2.00		
C17MEL62.2	CO2	3.00	3.00	2.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	2.00		
C17MEL62.3	CO3	2.00	2.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	2.00	1.00	0.00	2.00		
C17MEL62.4	CO4	2.00	1.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	2.00		
C17MEL62.5	CO5	2.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	2.00		
DIRECT ATTAINMENT		2.00	1.60	2.00	0.00	0.00	1.67	2.00	0.00	0.00	0.00	0.00	1.40	1.00	0.00	2.00		

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
SEMESTER END EXAMINATION	1.99	1.59	1.99	0.00	0.00	1.66	1.99	0.00	0.00	0.00	0.00	1.39	0.99	0.00	1.99		
ASSIGNMENT AND QUIZ\	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
CONTINUOUS INTERNAL EVALUATION	2.00	1.60	2.00	0.00	0.00	1.67	2.00	0.00	0.00	0.00	0.00	1.40	1.00	0.00	2.00		
FINAL DIRECT ATTAINMENT	1.99	1.59	1.99	0.00	0.00	1.66	1.99	0.00	0.00	0.00	0.00	1.39	0.99	0.00	1.99		

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
FINAL DIRECT ATTAINMENT	1.99	1.59	1.99	0.00	0.00	1.66	1.99	0.00	0.00	0.00	0.00	1.39	0.99	0.00	1.99		
PROGRAM EXIT SURVEY	1.27	1.00	1.24	0.00	0.00	1.04	1.23	0.00	0.00	0.00	0.00	0.88	0.63	0.00	1.26		
FINAL ATTAINMENT	1.92	1.53	1.91	0.00	0.00	1.60	1.91	0.00	0.00	0.00	0.00	1.34	0.96	0.00	1.92		

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	0

BATCH	2019-2020
SESSION	JAN2020To AUG 2020
SUBJECT	HEAT TRANSFER
SEMESTER	6
SUB CODE	17ME63

CLASS STRENGTH	154
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand the basic modes of heat transfer to Compute temperature distribution in steady-state and unsteady-state heat conduction
CO2	Analyse the heat transfer through extended surfaces. And transient heat conduction
CO3	Analyse the heat conduction by numerical method and explain the principle of radiation Heat transfer
CO4	Analyse the forced and free convective heat transfer.
CO5	Design of heat exchangers using LMTD, NTU methods and analyse the boiling and condensation

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME63.1	CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17ME63.2	CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17ME63.3	CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17ME63.4	CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17ME63.5	CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO - PO LEVEL		2.0	3.0	3.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	2.0	1.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	153	100.00%	99%	99%
CO2	153	100.00%	99%	99%
CO3	153	100.00%	99%	99%
CO4	153	100.00%	99%	99%
CO5	153	100.00%	99%	99%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	99%	3	67.2%	2	96%	3
CO2	99%	3	65.0%	2	96%	3
CO3	99%	3	57.1%	1	95%	3
CO4	99%	3	61.3%	2	95%	3
CO5	99%	3	56.9%	1	95%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME63.1	CO1	2.00	3.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	0.00	0.00
C17ME63.2	CO2	2.00	3.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	0.00	0.00
C17ME63.3	CO3	2.00	3.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	0.00	0.00
C17ME63.4	CO4	2.00	3.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	0.00	0.00
C17ME63.5	CO5	2.00	3.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	0.00	0.00
DIRECT ATTAINMENT		2.00	3.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.97	2.96	2.96	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	1.97	0.99	0.00	0.00
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	1.60	2.40	2.40	0.00	0.00	0.00	0.00	0.80	0.00	0.80	0.00	1.60	0.80	0.00	0.00
FINAL DIRECT ATTAINMENT	1.90	2.85	2.85	0.00	0.00	0.00	0.00	0.95	0.00	0.95	0.00	1.90	0.95	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.90	2.85	2.85	0.00	0.00	0.00	0.00	0.95	0.00	0.95	0.00	1.90	0.95	0.00	0.00
COURSE EXIT SURVEY	1.23	1.85	1.85	0.00	0.00	0.00	0.00	0.62	0.00	0.62	0.00	1.23	0.62	0.00	0.00
FINAL ATTAINMENT	1.83	2.75	2.75	0.00	0.00	0.00	0.00	0.92	0.00	0.92	0.00	1.83	0.92	0.00	0.00
% OF Attainment	91.6	91.6	91.6	0.0	0.0	0.0	0.0	91.6	0.0	91.6	0.0	91.6	91.6	0.0	0.0

17ME64-DME2-ABC

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2017
SESSION	Dec - Jan 2020
SUBJECT	DME-II
SEMESTER	6
SUB CODE	17ME64

CLASS STRENGTH	152
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	40%
WEIGHTAGE FOR SEMESTER END EXAMINATION	60%

Internal Marks Weightage	
Tests IA	Quiz + Assign
100 %	0%

CO PO Mapping : At the end of the course the student will be able to	
CO1	Design machine members with different cross sections of curved beams like C, I, H etc., Cylinders and cylinder heads and Mechanical systems involving springs, belts and pulleys
CO2	Design different types of gears (spur, bevel, helical and worm) and simple gear boxes for different applications
CO3	Design brakes and clutches and hydrodynamic bearings for different applications and Select Anti friction bearings for different applications using the manufacturers, catalogue.
CO4	Apply engineering design tools to product design with proficiency to generate production drawings using CAD software.
CO5	Become good design engineers through learning the art of working in a team with morality and ethics.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17ME64.1	CO1	3	3	3	2		2	3	3	3	2	3	3	3	2			
C17ME64.2	CO2	3	3	3	2		2	1	3	3	2	3	3	3	2			
C17ME64.3	CO3	3	3	3	2		2	1	3	3	2	3	3	3	2			
C17ME64.4	CO4	3	3	3	2		2	1	3	3	3	3	3	3	2			
C17ME64.5	CO5	3	3	3	2		2	1	3	3	3	3	3	3	2			
CO - PO LEVEL		3.0	3.0	3.0	2.0	0.0	2.0	1.4	3.0	3.0	2.4	3.0	3.0	3.0	2.0	0.0		

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
3	Substantially related	
2	Moderately related	
1	Slightly related	

INTERNAL ASSESSMENT		
Target>=60		
CO1	152	100 %
CO2	152	100 %
CO3	152	100 %
CO4	152	100 %
CO5	152	100 %

Targets for SEE			Targets for InA		
ABOVE	60%	3	75%	3	
ABOVE	50%	2	60%	2	
ABOVE	45%	1	45%	1	

COURSE OUTCOMES	CO ATTAINMENT LEVEL IA		SEE		FINAL		INDIRECT		TA	
CO1	100 %	3	100 %	3	100 %	3	60%	2	96 %	2.9
CO2	100 %	3	100 %	3	100 %	3	65%	2	97 %	2.9
CO3	100 %	3	100 %	3	100 %	3	61%	2	96 %	2.9
CO4	100 %	3	100 %	3	100 %	3	60%	2	96 %	2.9
CO5	100 %	3	100 %	3	100 %	3	63%	2	96 %	2.9

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3		
C17ME64.1	CO1	3.00	3.00	3.00	2.00	0.00	2.00	3.00	3.00	3.00	2.00	3.00	3.00	3.00	2.00	0.00		
C17ME64.2	CO2	3.00	3.00	3.00	2.00	0.00	2.00	1.00	3.00	3.00	2.00	3.00	3.00	3.00	2.00	0.00		
C17ME64.3	CO3	3.00	3.00	3.00	2.00	0.00	2.00	1.00	3.00	3.00	2.00	3.00	3.00	3.00	2.00	0.00		
C17ME64.4	CO4	3.00	3.00	3.00	2.00	0.00	2.00	1.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	0.00		
C17ME64.5	CO5	3.00	3.00	3.00	2.00	0.00	2.00	1.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	0.00		
DIRECT ATTAINMENT		3.00	3.00	3.00	2.00	0.00	2.00	1.40	3.00	3.00	2.40	3.00	3.00	3.00	2.00	0.00		

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
SEMESTER END EXAMINATION	3.00	3.00	3.00	2.00	0.00	2.00	1.40	3.00	3.00	2.40	3.00	3.00	3.00	2.00	0.00		
ASSIGNMENT AND QUIZ\	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
CONTINUOUS INTERNAL EVALUATION	3.00	3.00	3.00	2.00	0.00	2.00	1.40	3.00	3.00	2.40	3.00	3.00	3.00	2.00	0.00		
FINAL DIRECT ATTAINMENT	3.00	3.00	3.00	2.00	0.00	2.00	1.40	3.00	3.00	2.40	3.00	3.00	3.00	2.00	0.00		

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
FINAL DIRECT ATTAINMENT	3.00	3.00	3.00	2.00	0.00	2.00	1.40	3.00	3.00	2.40	3.00	3.00	3.00	2.00	0.00		
PROGRAM EXIT SURVEY	1.85	1.85	1.85	1.24	0.00	1.24	0.86	1.85	1.85	1.48	1.85	1.85	1.85	1.24	0.00		
FINAL ATTAINMENT	2.89	2.89	2.89	1.92	0.00	1.92	1.35	2.89	2.89	2.31	2.89	2.89	2.89	1.92	0.00		

17ME653-MF-ABC

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2017	CLASS STRENGTH	42		
SESSION	Feb-19	SET TARGET FOR INTERNAL ASSESSMENT (%)	60	Internal Marks Weightage	
SUBJECT	MF	SET TARGET FOR UNIVERSITY EXAMINATION (%)	50	Tests IA	Quiz + Assign
SEMESTER	6th	WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%	100 %	0%
SUB CODE	17ME653	WEIGHTAGE FOR SEMESTER END EXAMINATION	80%		

CO PO Mapping : At the end of the course the student will be able to	
CO1	Conduct different tests on transformers and evaluate their performance.
CO2	Connect and operate two single phase transformers of different kVA rating in parallel.
CO3	Connect single phase transformers for three phase operation and phase conversion.
CO4	Perform load test on single phase and three phase induction motor to assess its performance.
CO5	Conduct test on induction motor to pre-determine the performance characteristics.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17ME653.1	CO1	1	1	2	3	2				3	3	2	1	3	2	2		
C17ME653.2	CO2	2	2	1												2		
C17ME653.3	CO3	2	1	2												1		
C17ME653.4	CO4	2	2	1										2	2	1		
C17ME653.5	CO5	2	1	2										2	1	1		
CO - PO LEVEL		1.8	1.4	1.6	3.0	2.0	0.0	0.0	0.0	3.0	3.0	2.0	1.0	2.3	1.7	1.4		

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	42	100 %
CO2	42	100 %
CO3	42	100 %
CO4	42	100 %
CO5	42	100 %

Targets for SEE			Targets for InA		
ABOVE	60%	3	75%	3	
ABOVE	50%	2	60%	2	
ABOVE	45%	1	45%	1	

COURSE OUTCOMES	CO ATTAINMENT LEVEL IA		SEE		FINAL		INDIRECT		TA	
CO1	100 %	3	100 %	3	100 %	3	65%	2	97 %	2.9
CO2	100 %	3	100 %	3	100 %	3	61%	2	96 %	2.9
CO3	100 %	3	100 %	3	100 %	3	61%	2	96 %	2.9
CO4	100 %	3	100 %	3	100 %	3	61%	2	96 %	2.9
CO5	100 %	3	100 %	3	100 %	3	64%	2	96 %	2.9

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3		
C17ME653.1	CO1	1.00	1.00	2.00	3.00	2.00	0.00	0.00	0.00	3.00	3.00	2.00	1.00	3.00	2.00	2.00		
C17ME653.2	CO2	2.00	2.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00		
C17ME653.3	CO3	2.00	1.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00		
C17ME653.4	CO4	2.00	2.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	1.00		
C17ME653.5	CO5	2.00	1.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	1.00	1.00		
DIRECT ATTAINMENT		1.80	1.40	1.60	3.00	2.00	0.00	0.00	0.00	3.00	3.00	2.00	1.00	2.33	1.67	1.40		

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
SEMESTER END EXAMINATION	1.80	1.40	1.60	3.00	2.00	0.00	0.00	0.00	3.00	3.00	2.00	1.00	2.33	1.67	1.40		
ASSIGNMENT AND QUIZ\	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
CONTINUOUS INTERNAL EVALUATION	1.80	1.40	1.60	3.00	2.00	0.00	0.00	0.00	3.00	3.00	2.00	1.00	2.33	1.67	1.40		
FINAL DIRECT ATTAINMENT	1.80	1.40	1.60	3.00	2.00	0.00	0.00	0.00	3.00	3.00	2.00	1.00	2.33	1.67	1.40		

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
FINAL DIRECT ATTAINMENT	1.80	1.40	1.60	3.00	2.00	0.00	0.00	0.00	3.00	3.00	2.00	1.00	2.33	1.67	1.40		
PROGRAM EXIT SURVEY	1.12	0.87	1.00	1.95	1.30	0.00	0.00	0.00	1.95	1.95	1.30	0.65	1.48	1.05	0.88		
FINAL ATTAINMENT	1.73	1.35	1.54	2.90	1.93	0.00	0.00	0.00	2.90	2.90	1.93	0.97	2.25	1.61	1.35		

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	SH

BATCH	2019-2020
SESSION	JAN 2020To july 2020
SUBJECT	AUTOMOBILE ENGINEERING
SEMESTER	6
SUB CODE	17ME665

CLASS STRENGTH	54
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	To identify the different parts of an automobile and its working
CO2	TO understand the working of transmission and braking systems
CO3	To comprehend the working of steering and suspension systems
CO4	To learn various types of fuels and injection systems
CO5	To know the cause of automobile emissions its effects on environment and methods to reduce the emissions

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME665.1	CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17ME665.2	CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17ME665.3	CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17ME665.4	CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17ME665.5	CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO - PO LEVEL		2.0	3.0	3.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	2.0	1.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	53	100.00%	91%	93%
CO2	53	100.00%	91%	93%
CO3	53	100.00%	91%	93%
CO4	53	100.00%	91%	93%
CO5	53	100.00%	91%	93%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	93%	3	66.7%	2	90%	3
CO2	93%	3	67.3%	2	90%	3
CO3	93%	3	68.8%	2	90%	3
CO4	93%	3	69.5%	2	90%	3
CO5	93%	3	69.8%	2	90%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME665.1	CO1	2.00	3.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	0.00	0.00
C17ME665.2	CO2	2.00	3.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	0.00	0.00
C17ME665.3	CO3	2.00	3.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	0.00	0.00
C17ME665.4	CO4	2.00	3.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	0.00	0.00
C17ME665.5	CO5	2.00	3.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	0.00	0.00
DIRECT ATTAINMENT		2.00	3.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.82	2.73	2.73	0.00	0.00	0.00	0.00	0.91	0.00	0.91	0.00	1.82	0.91	0.00	0.00
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	1.60	2.40	2.40	0.00	0.00	0.00	0.00	0.80	0.00	0.80	0.00	1.60	0.80	0.00	0.00
FINAL DIRECT ATTAINMENT	1.77	2.66	2.66	0.00	0.00	0.00	0.00	0.89	0.00	0.89	0.00	1.77	0.89	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.77	2.66	2.66	0.00	0.00	0.00	0.00	0.89	0.00	0.89	0.00	1.77	0.89	0.00	0.00
COURSE EXIT SURVEY	1.37	2.05	2.05	0.00	0.00	0.00	0.00	0.68	0.00	0.68	0.00	1.37	0.68	0.00	0.00
FINAL ATTAINMENT	1.73	2.60	2.60	0.00	0.00	0.00	0.00	0.87	0.00	0.87	0.00	1.73	0.87	0.00	0.00
% OF Attainment	86.7	86.7	86.7	0.0	0.0	0.0	0.0	86.7	0.0	86.7	0.0	86.7	86.7	0.0	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	SH

BATCH	2019-2020
SESSION	JAN 2020To july 2020
SUBJECT	AUTOMOBILE ENGINEERING
SEMESTER	6
SUB CODE	17ME665

CLASS STRENGTH	61
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	To identify the different parts of an automobile and its working
CO2	TO understand the working of transmission and braking systems
CO3	To comprehend the working of steering and suspension systems
CO4	To learn various types of fuels and injection systems
CO5	To know the cause of automobile emissions its effects on environment and methods to reduce the emissions

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME665.1	CO1	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17ME665.2	CO2	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17ME665.3	CO3	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17ME665.4	CO4	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
C17ME665.5	CO5	2	3	3	0	0	0	0	1	0	1	0	2	1	0	0
CO - PO LEVEL		2.0	3.0	3.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	2.0	1.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct C O % Attainment
CO1	60	100.00%	97%	97%
CO2	60	100.00%	97%	97%
CO3	60	100.00%	97%	97%
CO4	60	100.00%	97%	97%
CO5	60	100.00%	97%	97%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	97%	3	66.7%	2	94%	3
CO2	97%	3	67.3%	2	94%	3
CO3	97%	3	68.8%	2	95%	3
CO4	97%	3	69.5%	2	95%	3
CO5	97%	3	69.8%	2	95%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME665.1	CO1	2.00	3.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	0.00	0.00
C17ME665.2	CO2	2.00	3.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	0.00	0.00
C17ME665.3	CO3	2.00	3.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	0.00	0.00
C17ME665.4	CO4	2.00	3.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	0.00	0.00
C17ME665.5	CO5	2.00	3.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	0.00	0.00
DIRECT ATTAINMENT		2.00	3.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	1.00	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.94	2.90	2.90	0.00	0.00	0.00	0.00	0.97	0.00	0.97	0.00	1.94	0.97	0.00	0.00
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	1.60	2.40	2.40	0.00	0.00	0.00	0.00	0.80	0.00	0.80	0.00	1.60	0.80	0.00	0.00
FINAL DIRECT ATTAINMENT	1.87	2.80	2.80	0.00	0.00	0.00	0.00	0.93	0.00	0.93	0.00	1.87	0.93	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.87	2.80	2.80	0.00	0.00	0.00	0.00	0.93	0.00	0.93	0.00	1.87	0.93	0.00	0.00
COURSE EXIT SURVEY	1.37	2.05	2.05	0.00	0.00	0.00	0.00	0.68	0.00	0.68	0.00	1.37	0.68	0.00	0.00
FINAL ATTAINMENT	1.82	2.73	2.73	0.00	0.00	0.00	0.00	0.91	0.00	0.91	0.00	1.82	0.91	0.00	0.00
% OF Attainment	90.9	90.9	90.9	0.0	0.0	0.0	0.0	90.9	0.0	90.9	0.0	90.9	90.9	0.0	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	VR

BATCH	2020-2021
SESSION	AUG 2020To DEC 2020/Jan 2021
SUBJECT	Industrial Safety
SEMESTER	6
SUB CODE	17ME662

CLASS STRENGTH	154
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand the basic safety terms and identify the hazards around the work environment
CO2	Able to identify the hazards and demonstrate the portable extinguishers used for different classes of fires. Identify the sign boards.
CO3	Able to identify the mechanical hazards. Use the safe measures in workshops, machine shops and handling of materials.
CO4	Identify the electrical hazards around work environment. Acquire the knowledge of safe measures while performing work in electric plant, residential building.
CO5	Able to identify the chemical hazards around work environment. And safe use safe measures in chemical labs and chemical plant.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME662.1	CO1	3	0	0	0	0	2	1	0	2	0	2	1	0	2	0
C17ME662.2	CO2	3	2	0	0	0	2	1	0	2	0	2	1	0	2	0
C17ME662.3	CO3	3	2	0	0	0	2	1	0	2	0	2	1	0	2	0
C17ME662.4	CO4	3	2	0	0	0	2	1	0	2	0	2	1	0	2	0
C17ME662.5	CO5	3	2	0	0	0	2	1	0	2	0	2	1	0	2	0
CO - PO LEVEL		3.0	2.0	0.0	0.0	0.0	2.0	1.0	0.0	2.0	0.0	2.0	1.0	0.0	2.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			S E E	Final Direct C O % Attainment
CO1	153	100.00%	99%	99%
CO2	153	100.00%	99%	99%
CO3	153	100.00%	99%	99%
CO4	153	100.00%	99%	99%
CO5	153	100.00%	99%	99%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	99%	3	73.7%	2	96%	3
CO2	99%	3	72.3%	2	96%	3
CO3	99%	3	73.1%	2	96%	3
CO4	99%	3	72.1%	2	96%	3
CO5	99%	3	71.2%	2	96%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME662.1	CO1	3.00	0.00	0.00	0.00	0.00	2.00	1.00	0.00	2.00	0.00	2.00	1.00	0.00	2.00	0.00
C17ME662.2	CO2	3.00	2.00	0.00	0.00	0.00	2.00	1.00	0.00	2.00	0.00	2.00	1.00	0.00	2.00	0.00
C17ME662.3	CO3	3.00	2.00	0.00	0.00	0.00	2.00	1.00	0.00	2.00	0.00	2.00	1.00	0.00	2.00	0.00
C17ME662.4	CO4	3.00	2.00	0.00	0.00	0.00	2.00	1.00	0.00	2.00	0.00	2.00	1.00	0.00	2.00	0.00
C17ME662.5	CO5	3.00	2.00	0.00	0.00	0.00	2.00	1.00	0.00	2.00	0.00	2.00	1.00	0.00	2.00	0.00
DIRECT ATTAINMENT		3.00	2.00	0.00	0.00	0.00	2.00	1.00	0.00	2.00	0.00	2.00	1.00	0.00	2.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.96	1.97	0.00	0.00	0.00	1.97	0.99	0.00	1.97	0.00	1.97	0.99	0.00	1.97	0.00
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	2.40	1.60	0.00	0.00	0.00	1.60	0.80	0.00	1.60	0.00	1.60	0.80	0.00	1.60	0.00
FINAL DIRECT ATTAINMENT	2.85	1.90	0.00	0.00	0.00	1.90	0.95	0.00	1.90	0.00	1.90	0.95	0.00	1.90	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.85	1.90	0.00	0.00	0.00	1.90	0.95	0.00	1.90	0.00	1.90	0.95	0.00	1.90	0.00
COURSE EXIT SURVEY	2.17	1.44	0.00	0.00	0.00	1.45	0.72	0.00	1.45	0.00	1.45	0.72	0.00	1.45	0.00
FINAL ATTAINMENT	2.78	1.85	0.00	0.00	0.00	1.85	0.93	0.00	1.85	0.00	1.85	0.93	0.00	1.85	0.00
% OF Attainment	92.7	92.7	0.0	0.0	0.0	92.7	92.7	0.0	92.7	0.0	92.7	92.7	0.0	92.7	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	MJN

BATCH	2019 -2020
SESSION	Feb 2020 To May 2020
SUBJECT	Heat Transfer LAB
SEMESTER	6
SUB CODE	17MEL67

CLASS STRENGTH	152
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
100%	0%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Perform experiments to determine the thermal conductivity of a metal rod
CO2	Conduct experiments to determine convective heat transfer coefficient for free and forced convection and correlate with theoretical values.
CO3	Estimate the effective thermal resistance in composite slabs and efficiency in pin-fin, and surface emissivity of a test plate
CO4	Estimate performance of a refrigerator and effectiveness of fin
CO5	Calculate temperature distribution of study and transient heat conduction through plane wall, cylinder and fin using numerical approach.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MEL67.1	CO1	3	1	0	0	0	0	0	0	0	0	0	0	2	2	0
C17MEL67.2	CO2	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0
C17MEL67.3	CO3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0
C17MEL67.4	CO4	3	1	0	0	0	0	0	0	0	0	0	1	0	0	0
C17MEL67.5	CO5	3	1	0	0	1	0	0	0	0	0	0	1	0	0	0
CO - PO LEVEL		3.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	152	100.00%	100%	100%
CO2	152	100.00%	100%	100%
CO3	152	100.00%	100%	100%
CO4	152	100.00%	100%	100%
CO5	152	100.00%	100%	100%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	100%	3	62.8%	2	96%	3
CO2	100%	3	60.5%	2	96%	3
CO3	100%	3	63.0%	2	96%	3
CO4	100%	3	61.9%	2	96%	3
CO5	100%	3	59.3%	1	96%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MEL67.1	CO1	3.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00
C17MEL67.2	CO2	3.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C17MEL67.3	CO3	3.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C17MEL67.4	CO4	3.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#VALUE!	0.00	0.00	0.00
C17MEL67.5	CO5	3.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	#VALUE!	0.00	0.00	0.00
DIRECT ATTAINMENT		3.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	3.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	3.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00
FINAL DIRECT ATTAINMENT	3.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	3.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00
COURSE EXIT SURVEY	1.84	0.61	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.26	1.26	0.00
FINAL ATTAINMENT	2.88	0.96	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.93	1.93	0.00
% OF Attainment	96.1	96.1	0.0	0.0	95.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	96.3	96.3	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

ESTD : 2001 — An Institution with a Difference

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2017
SESSION	Aug - Dec 2018
SUBJECT	CAMA LAB
SEMESTER	6
SUB CODE	17MEL68

CLASS STRENGTH	154
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage	
Tests IA	Quiz + Assign
100%	0%

CO PO Mapping : At the end of the course the student will be able to

CO1	Utilize the analysis software to create geometry, discretize, apply boundary condition to solve stress related problems on bars, Trusses and plate for different loading conditions
CO2	Demonstrate the deflection of beams subjected to point, uniformly distributed and varying loads further to use the available of results to draw shear force and bending moment diagrams.
CO3	Analyze the given problem by applying basic principle to solve and demonstrate 1D and 2D heat transfer with conduction and convection boundary conditions
CO4	Predict the dynamic Characteristics and nature frequency of 2D components for various boundary condition and also analyze with forcing function.
CO5	Predict the dynamic Characteristics and nature frequency of 2D components for various boundary condition and also analyze with forcing function.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17MEL68.1	CO1	3			1				1		1		1	1				
C17MEL68.2	CO2	3			3	1	1		1		3			2				
C17MEL68.3	CO3	3			1	1	1		1		1		1	2				
C17MEL68.4	CO4	3			2						2		1	2				
C17MEL68.5	CO5	3			2						2		1	2				
CO - PO LEVEL		3.0	0.0	0.0	1.8	1.0	1.0	0.0	1.0	0.0	1.8	0.0	1.0	1.8	0.0	0.0		

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	153	99%
CO2	153	99%
CO3	153	99%
CO4	153	99%
CO5	153	99%

Targets for SEE			Targets for InA		
ABOVE	60%	3	75%	3	
ABOVE	50%	2	60%	2	
ABOVE	45%	1	45%	1	

COURSE OUTCOMES	CO ATTAINMENT LEVEL						INDIRECT		TA	
	IA		SEE		FINAL					
CO1	99%	3	99%	3	99%	3	63%	2	96%	3
CO2	99%	3	99%	3	99%	3	63%	2	96%	3
CO3	99%	3	99%	3	99%	3	62%	2	96%	3
CO4	99%	3	99%	3	99%	3	59%	1	95%	3
CO5	99%	3	99%	3	99%	3	59%	1	95%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17MEL68.1	CO1	2.98	0.00	0.00	0.99	0.00	0.00	0.00	0.99	0.00	0.99	0.00	0.99	0.99	0.00	0.00		
C17MEL68.2	CO2	2.98	0.00	0.00	2.98	0.99	0.99	0.00	0.99	0.00	2.98	0.00	0.00	1.99	0.00	0.00		
C17MEL68.3	CO3	2.98	0.00	0.00	0.99	0.99	0.99	0.00	0.99	0.00	0.99	0.00	0.99	1.99	0.00	0.00		
C17MEL68.4	CO4	2.98	0.00	0.00	1.99	0.00	0.00	0.00	0.00	0.00	1.99	0.00	0.99	1.99	0.00	0.00		
C17MEL68.5	CO5	2.98	0.00	0.00	1.99	0.00	0.00	0.00	0.00	0.00	1.99	0.00	0.99	1.99	0.00	0.00		
DIRECT ATTAINMENT		2.98	0.00	0.00	1.79	0.99	0.99	0.00	0.99	0.00	1.79	0.00	0.99	1.79	0.00	0.00		

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
SEMESTER END EXAMINATION	2.98	0.00	0.00	1.79	0.99	0.99	0.00	0.99	0.00	1.79	0.00	0.99	1.79	0.00	0.00		
ASSIGNMENT AND QUIZ\	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
CONTINUOUS INTERNAL EVALUATION	2.98	0.00	0.00	1.79	0.99	0.99	0.00	0.99	0.00	1.79	0.00	0.99	1.79	0.00	0.00		
FINAL DIRECT ATTAINMENT	2.98	0.00	0.00	1.79	0.99	0.99	0.00	0.99	0.00	1.79	0.00	0.99	1.79	0.00	0.00		

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
FINAL DIRECT ATTAINMENT	2.98	0.00	0.00	1.79	0.99	0.99	0.00	0.99	0.00	1.79	0.00	0.99	1.79	0.00	0.00		
PROGRAM EXIT SURVEY	1.84	0.00	0.00	1.10	0.63	0.63	0.00	0.63	0.00	1.10	0.00	0.61	1.10	0.00	0.00		
FINAL ATTAINMENT	2.87	0.00	0.00	1.72	0.96	0.96	0.00	0.96	0.00	1.72	0.00	0.95	1.72	0.00	0.00		

17ME71-EE-A

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	SP

BATCH	2019 -2020
SESSION	Aug 2020 To December 2020
SUBJECT	Energy Engineering
SEMESTER	VII A
SUB CODE	17ME71

CLASS STRENGTH	51
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand the basic concepts of thermal energy systems.
CO2	Identify renewable energy sources and their utilization.
CO3	Analyse the concepts of solar radiation and study the working of solar PV and thermal systems.
CO4	Demonstrate principles of energy conversion from alternate sources including wind, tides.
CO5	Illustrate the concepts and applications of fuel cells, biomass, thermoelectric convertor and MHD generator and study of energy storage for specific applications. Concept of green energy.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME71.1	CO1	1	1	0	0	0	1	2	0	0	0	0	2	1	0	2
C17ME71.2	CO2	3	3	2	0	0	0	2	0	0	0	0	1	1	0	2
C17ME71.3	CO3	2	2	0	0	0	2	0	0	0	0	0	2	1	0	2
C17ME71.4	CO4	2	1	0	0	0	2	0	0	0	0	0	1	1	0	2
C17ME71.5	CO5	2	1	0	0	0	0	0	0	0	0	0	1	1	0	2
CO - PO LEVEL		2.0	1.6	2.0	0.0	0.0	1.7	2.0	0.0	0.0	0.0	0.0	1.4	1.0	0.0	2.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	51	100.00%	52%	61%
CO2	50	98.04%	52%	61%
CO3	51	100.00%	52%	61%
CO4	51	100.00%	52%	61%
CO5	51	100.00%	52%	61%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	61%	2	71.8%	2	62%	2
CO2	61%	2	74.4%	2	62%	2
CO3	61%	2	74.4%	2	63%	2
CO4	61%	2	74.4%	2	63%	2
CO5	61%	2	69.2%	2	62%	2

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME71.1	CO1	1.00	1.00	0.00	0.00	0.00	1.00	2.00	0.00	0.00	0.00	0.00	2.00	1.00	0.00	2.00
C17ME71.2	CO2	2.94	2.94	1.96	0.00	0.00	0.00	1.96	0.00	0.00	0.00	0.00	0.98	0.98	0.00	1.96
C17ME71.3	CO3	2.00	2.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	2.00	1.00	0.00	2.00
C17ME71.4	CO4	2.00	1.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	2.00
C17ME71.5	CO5	2.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	2.00
DIRECT ATTAINMENT		1.99	1.59	1.96	0.00	0.00	1.67	1.98	0.00	0.00	0.00	0.00	1.40	1.00	0.00	1.99

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.03	0.82	1.03	0.00	0.00	0.86	1.03	0.00	0.00	0.00	0.00	0.72	0.52	0.00	1.03
ASSIGNMENT AND QUIZ	0.40	0.32	0.40	0.00	0.00	0.33	0.40	0.00	0.00	0.00	0.00	0.28	0.20	0.00	0.40
CONTINUOUS INTERNAL EVALUATION	1.59	1.27	1.57	0.00	0.00	1.33	1.58	0.00	0.00	0.00	0.00	1.12	0.80	0.00	1.59
FINAL DIRECT ATTAINMENT	1.22	0.98	1.22	0.00	0.00	1.02	1.22	0.00	0.00	0.00	0.00	0.86	0.61	0.00	1.22

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.22	0.98	1.22	0.00	0.00	1.02	1.22	0.00	0.00	0.00	0.00	0.86	0.61	0.00	1.22
COURSE EXIT SURVEY	1.46	1.17	1.49	0.00	0.00	1.23	1.46	0.00	0.00	0.00	0.00	1.02	0.73	0.00	1.46
FINAL ATTAINMENT	1.25	1.00	1.25	0.00	0.00	1.04	1.25	0.00	0.00	0.00	0.00	0.87	0.62	0.00	1.25
% OF Attainment	62.3	62.3	62.3	0.0	0.0	62.5	62.3	0.0	0.0	0.0	0.0	62.4	62.3	0.0	62.3

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	Dr MP

BATCH	2019 -2020
SESSION	Aug 2020 To December 2020
SUBJECT	Energy Engineering
SEMESTER	VII B
SUB CODE	17ME71

CLASS STRENGTH	52
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand the basic concepts of thermal energy systems.
CO2	Identify renewable energy sources and their utilization.
CO3	Analyse the concepts of solar radiation and study the working of solar PV and thermal systems.
CO4	Demonstrate principles of energy conversion from alternate sources including wind, tides.
CO5	Illustrate the concepts and applications of fuel cells, biomass, thermoelectric convertor and MHD generator and study of energy storage for specific applications. Concept of green energy.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME71.1	CO1	1	1	0	0	0	1	2	0	0	0	0	2	1	0	2
C17ME71.2	CO2	3	3	2	0	0	0	2	0	0	0	0	1	1	0	2
C17ME71.3	CO3	2	2	0	0	0	2	0	0	0	0	0	2	1	0	2
C17ME71.4	CO4	2	1	0	0	0	2	0	0	0	0	0	1	1	0	2
C17ME71.5	CO5	2	1	0	0	0	0	0	0	0	0	0	1	1	0	2

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			S E E	Final Direct C O % Attainment
Target>=60				
CO1	52	100.00%	77%	81%
CO2	52	100.00%	77%	81%
CO3	52	100.00%	77%	81%
CO4	52	100.00%	77%	81%
CO5	52	100.00%	77%	81%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	81%	3	71.8%	2	80%	3
CO2	81%	3	74.4%	2	81%	3
CO3	81%	3	74.4%	2	81%	3
CO4	81%	3	74.4%	2	81%	3
CO5	81%	3	69.2%	2	80%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME71.1	CO1	1.00	1.00	0.00	0.00	0.00	1.00	2.00	0.00	0.00	0.00	0.00	2.00	1.00	0.00	2.00
C17ME71.2	CO2	3.00	3.00	2.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	2.00
C17ME71.3	CO3	2.00	2.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	2.00	1.00	0.00	2.00
C17ME71.4	CO4	2.00	1.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	2.00
C17ME71.5	CO5	2.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	2.00
DIRECT ATTAINMENT		2.00	1.60	2.00	0.00	0.00	1.67	2.00	0.00	0.00	0.00	0.00	1.40	1.00	0.00	2.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.53	1.23	1.53	0.00	0.00	1.28	1.53	0.00	0.00	0.00	0.00	1.07	0.77	0.00	1.53
ASSIGNMENT AND QUIZ	0.40	0.32	0.40	0.00	0.00	0.33	0.40	0.00	0.00	0.00	0.00	0.28	0.20	0.00	0.40
CONTINUOUS INTERNAL EVALUATION	1.60	1.28	1.60	0.00	0.00	1.33	1.60	0.00	0.00	0.00	0.00	1.12	0.80	0.00	1.60
FINAL DIRECT ATTAINMENT	1.63	1.30	1.63	0.00	0.00	1.36	1.63	0.00	0.00	0.00	0.00	1.14	0.81	0.00	1.63

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.63	1.30	1.63	0.00	0.00	1.36	1.63	0.00	0.00	0.00	0.00	1.14	0.81	0.00	1.63
COURSE EXIT SURVEY	1.46	1.17	1.49	0.00	0.00	1.23	1.46	0.00	0.00	0.00	0.00	1.02	0.73	0.00	1.46
FINAL ATTAINMENT	1.61	1.29	1.61	0.00	0.00	1.34	1.61	0.00	0.00	0.00	0.00	1.13	0.81	0.00	1.61
% OF Attainment	80.6	80.6	80.7	0.0	0.0	80.6	80.6	0.0	0.0	0.0	0.0	80.5	80.5	0.0	80.5

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	DrTKC

BATCH	2019 -2020
SESSION	Aug 2020 To December 2020
SUBJECT	Energy Engineering
SEMESTER	VII C
SUB CODE	17ME71

CLASS STRENGTH	50
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand the basic concepts of thermal energy systems.
CO2	Identify renewable energy sources and their utilization.
CO3	Analyse the concepts of solar radiation and study the working of solar PV and thermal systems.
CO4	Demonstrate principles of energy conversion from alternate sources including wind, tides.
CO5	Illustrate the concepts and applications of fuel cells, biomass, thermoelectric convertor and MHD generator and study of energy storage for specific applications. Concept of green energy.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME71.1	CO1	1	1	0	0	0	1	2	0	0	0	0	2	1	0	2
C17ME71.2	CO2	3	3	2	0	0	0	2	0	0	0	0	1	1	0	2
C17ME71.3	CO3	2	2	0	0	0	2	0	0	0	0	0	2	1	0	2
C17ME71.4	CO4	2	1	0	0	0	2	0	0	0	0	0	1	1	0	2
C17ME71.5	CO5	2	1	0	0	0	0	0	0	0	0	0	1	1	0	2
CO - PO LEVEL		2.0	1.6	2.0	0.0	0.0	1.7	2.0	0.0	0.0	0.0	0.0	1.4	1.0	0.0	2.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	50	100.00%	53%	62%
CO2	50	100.00%	53%	62%
CO3	50	100.00%	53%	62%
CO4	49	100.00%	53%	62%
CO5	50	100.00%	53%	62%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	62%	2	71.8%	2	63%	2
CO2	62%	2	74.4%	2	63%	2
CO3	62%	2	74.4%	2	63%	2
CO4	62%	2	74.4%	2	63%	2
CO5	62%	2	69.2%	2	63%	2

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME71.1	CO1	1.00	1.00	0.00	0.00	0.00	1.00	2.00	0.00	0.00	0.00	0.00	2.00	1.00	0.00	2.00
C17ME71.2	CO2	3.00	3.00	2.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	2.00
C17ME71.3	CO3	2.00	2.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	2.00	1.00	0.00	2.00
C17ME71.4	CO4	2.00	1.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	2.00
C17ME71.5	CO5	2.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	2.00
DIRECT ATTAINMENT		2.00	1.60	2.00	0.00	0.00	1.67	2.00	0.00	0.00	0.00	0.00	1.40	1.00	0.00	2.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.05	0.84	1.05	0.00	0.00	0.88	1.05	0.00	0.00	0.00	0.00	0.74	0.53	0.00	1.05
ASSIGNMENT AND QUIZ	0.40	0.32	0.40	0.00	0.00	0.33	0.40	0.00	0.00	0.00	0.00	0.28	0.20	0.00	0.40
CONTINUOUS INTERNAL EVALUATION	1.60	1.28	1.60	0.00	0.00	1.33	1.60	0.00	0.00	0.00	0.00	1.12	0.80	0.00	1.60
FINAL DIRECT ATTAINMENT	1.24	0.99	1.24	0.00	0.00	1.04	1.24	0.00	0.00	0.00	0.00	0.87	0.62	0.00	1.24

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.24	0.99	1.24	0.00	0.00	1.04	1.24	0.00	0.00	0.00	0.00	0.87	0.62	0.00	1.24
COURSE EXIT SURVEY	1.46	1.17	1.49	0.00	0.00	1.23	1.46	0.00	0.00	0.00	0.00	1.02	0.73	0.00	1.46
FINAL ATTAINMENT	1.26	1.01	1.27	0.00	0.00	1.05	1.26	0.00	0.00	0.00	0.00	0.88	0.63	0.00	1.26
% OF Attainment	63.2	63.2	63.3	0.0	0.0	63.3	63.2	0.0	0.0	0.0	0.0	63.2	63.2	0.0	63.2

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

ESTD : 2001 An Institution with a Difference

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2017-18	CLASS STRENGTH	51		
SESSION	Feb - Jun 2021	SET TARGET FOR INTERNAL ASSESSMENT (%)	60	Internal Marks Weightage	
SUBJECT	FLUID POWER SYSTEMS	SET TARGET FOR UNIVERSITY EXAMINATION (%)	50	Tests IA	Quiz + Assign
SEMESTER	7 (A SEC)	WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%	80%	20%
SUB CODE	17ME72	WEIGHTAGE FOR SEMESTER END EXAMINATION	80%		

CO PO Mapping

CO1	To provide an insight into the capabilities of hydraulic and pneumatic fluid power.
CO2	To understand concepts and relationships surrounding force, pressure, energy and power in fluid power systems
CO3	To examine concepts centering on sources of hydraulic power, rotary and linear actuators, distribution systems, hydraulic flow in pipes, andcontrol components in fluid power systems
CO4	Exposure to build and interpret hydraulic and pneumatic circuits related to industrial applications
CO5	To familiarize with logic controls and trouble shooting

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME72.1	CO1	3	3								1		2	2	1	1
C17ME72.2	CO2	3	3	2		2					1		2	2	1	
C17ME72.3	CO3	3	3	2		2					1		2	2	1	
C17ME72.4	CO4	3		2		2					1		2	2	1	
C17ME72.5	CO5	3		2		2					1		2	2	1	1
CO - PO LEVEL		3.0	3.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	1.0	0.0	2.0	2.0	1.0	1.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	46	90.20%
CO2	51	100.00%
CO3	50	98.04%
CO4	51	100.00%
CO5	51	100.00%

Targets for SEE			Targets for InA		
ABOVE	60%	3	75%	3	
ABOVE	50%	2	60%	2	
ABOVE	45%	1	45%	1	

COURSE OUTCOMES	ATTAINMENT LEVEL							
	IA		SEE		FINAL		Indirect Attainment	Final
CO1	90.20%	3	63%	3	87%	3	80%	3	3
CO2	100.00%	3	63%	3	96%	3	65%	2	2.9
CO3	98.04%	0	63%	3	95%	3	85%	3	3
CO4	100.00%	3	63%	3	96%	3	78%	3	3
CO5	100.00%	3	63%	3	96%	3	78%	3	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME72.1	CO1	2.71	2.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90	0.00	1.80	1.80	0.90	0.90
C17ME72.2	CO2	3.00	3.00	2.00	0.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	2.00	2.00	1.00	0.00
C17ME72.3	CO3	2.94	2.94	1.96	0.00	1.96	0.00	0.00	0.00	0.00	0.98	0.00	1.96	1.96	0.98	0.00
C17ME72.4	CO4	3.00	0.00	2.00	0.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	2.00	2.00	1.00	0.00
C17ME72.5	CO5	3.00	0.00	2.00	0.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	2.00	2.00	1.00	1.00
DIRECT ATTAINMENT		2.93	2.88	1.99	0.00	1.99	0.00	0.00	0.00	0.00	0.98	0.00	1.95	1.95	0.98	0.95

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.88	1.88	1.25	0.00	1.25	0.00	0.00	0.00	0.00	0.63	0.00	1.25	1.25	0.63	0.63
ASSIGNMENT AND QUIZ	0.60	0.60	0.40	0.00	0.40	0.00	0.00	0.00	0.00	0.20	0.00	0.40	0.40	0.20	0.20
CONTINUOUS INTERNAL EVALUATION	2.34	2.31	1.59	0.00	1.59	0.00	0.00	0.00	0.00	0.78	0.00	1.56	1.56	0.78	0.76
FINAL DIRECT ATTAINMENT	2.09	2.09	1.40	0.00	1.40	0.00	0.00	0.00	0.00	0.70	0.00	1.40	1.40	0.70	0.69

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.09	2.09	1.40	0.00	1.40	0.00	0.00	0.00	0.00	0.70	0.00	1.40	1.40	0.70	0.69
PROGRAM EXIT SURVEY	1.21	1.21	1.66	0.77	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.66	1.58	0.79
FINAL ATTAINMENT	2.01	2.00	1.43	0.08	1.33	0.00	0.00	0.00	0.00	0.63	0.00	1.26	1.42	0.79	0.70

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

ESTD : 2001 An Institution with a Difference

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2017-18
SESSION	Feb - Jun 2021
SUBJECT	FLUID POWER SYSTEMS
SEMESTER	7 (B SEC)
SUB CODE	17ME72

CLASS STRENGTH	52
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage	
Tests IA	Quiz + Assign
80%	20%

CO PO Mapping	
CO1	To provide an insight into the capabilities of hydraulic and pneumatic fluid power.
CO2	To understand concepts and relationships surrounding force, pressure, energy and power in fluid power systems
CO3	To examine concepts centering on sources of hydraulic power, rotary and linear actuators, distribution systems, hydraulic flow in pipes, andcontrol components in fluid power systems
CO4	Exposure to build and interpret hydraulic and pneumatic circuits related to industrial applications
CO5	To familiarize with logic controls and trouble shooting

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME72.1	CO1	3	3								1		2	2	1	
C17ME72.2	CO2	3	3	2		2					1		2	2	1	
C17ME72.3	CO3	3	3	2		2					1		2	2	1	
C17ME72.4	CO4	3		2		2					1		2	2	1	
C17ME72.5	CO5	3		2		2					1		2	2	1	
CO - PO LEVEL		3.0	3.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	1.0	0.0	2.0	2.0	1.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	52	100.00%
CO2	52	100.00%
CO3	51	98.08%
CO4	52	100.00%
CO5	52	100.00%

Targets for SEE			Targets for InA		
ABOVE	60%	3	75%	3	
ABOVE	50%	2	60%	2	
ABOVE	45%	1	45%	1	

COURSE OUTCOMES	ATTAINMENT LEVEL							
	IA		SEE		FINAL		Indirect Attainment	Final
CO1	100.00%	3	79%	3	98%	3	73%	2	2.9
CO2	100.00%	3	79%	3	98%	3	72%	2	2.9
CO3	98.08%	3	79%	3	96%	3	67%	2	2.9
CO4	100.00%	3	79%	3	98%	3	66%	2	2.9
CO5	100.00%	3	79%	3	98%	3	69%	2	2.9

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME72.1	CO1	3.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	2.00	2.00	1.00	0.00
C17ME72.2	CO2	3.00	3.00	2.00	0.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	2.00	2.00	1.00	0.00
C17ME72.3	CO3	2.94	2.94	1.96	0.00	1.96	0.00	0.00	0.00	0.00	0.98	0.00	1.96	1.96	0.98	0.00
C17ME72.4	CO4	3.00	0.00	2.00	0.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	2.00	2.00	1.00	0.00
C17ME72.5	CO5	3.00	0.00	2.00	0.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	2.00	2.00	1.00	0.00
DIRECT ATTAINMENT		2.99	2.98	1.99	0.00	1.99	0.00	0.00	0.00	0.00	1.00	0.00	1.99	1.99	1.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.37	2.37	1.58	0.00	1.58	0.00	0.00	0.00	0.00	0.79	0.00	1.58	1.58	0.79	0.00
ASSIGNMENT AND QUIZ	0.60	0.60	0.40	0.00	0.40	0.00	0.00	0.00	0.00	0.20	0.00	0.40	0.40	0.20	0.00
CONTINUOUS INTERNAL EVALUATION	2.39	2.38	1.59	0.00	1.59	0.00	0.00	0.00	0.00	0.80	0.00	1.59	1.59	0.80	0.00
FINAL DIRECT ATTAINMENT	2.49	2.49	1.66	0.00	1.66	0.00	0.00	0.00	0.00	0.83	0.00	1.66	1.66	0.83	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.49	2.49	1.66	0.00	1.66	0.00	0.00	0.00	0.00	0.83	0.00	1.66	1.66	0.83	0.00
PROGRAM EXIT SURVEY	1.11	1.11	1.52	0.70	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.52	1.42	0.71
FINAL ATTAINMENT	2.35	2.35	1.65	0.07	1.56	0.00	0.00	0.00	0.00	0.75	0.00	1.49	1.65	0.89	0.07

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	HCM

BATCH	2020-21
SESSION	August 2020 To December 2020
SUBJECT	Fluid Power System
SEMESTER	7C
SUB CODE	17ME72

CLASS STRENGTH	51
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	To provide an insight into the capabilities of hydraulic and pneumatic fluid power.
CO2	To understand concepts and relationships surrounding force, pressure, energy and power in fluid power systems
CO3	To examine concepts centering on sources of hydraulic power, rotary and linear actuators, distribution systems, hydraulic flow in pipes, andcontrol components in fluid power systems
CO4	Exposure to build and interpret hydraulic and pneumatic circuits related to industrial applications
CO5	To familiarize with logic controls and trouble shooting

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME72.1	CO1	3	3	0	0	0	0	0	0	0	1	0	2	2	1	1
C17ME72.2	CO2	3	3	2	0	2	0	0	0	0	1	0	2	2	1	0
C17ME72.3	CO3	3	3	2	0	2	0	0	0	0	1	0	2	2	1	0
C17ME72.4	CO4	3	0	2	0	2	0	0	0	0	1	0	2	2	1	0
C17ME72.5	CO5	3	0	2	0	2	0	0	0	0	1	0	2	2	1	1
CO - PO LEVEL		3.0	3.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	1.0	0.0	2.0	2.0	1.0	1.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	50	98.04%	76%	81%
CO2	51	100.00%	76%	81%
CO3	51	100.00%	76%	81%
CO4	50	100.00%	76%	81%
CO5	48	97.96%	76%	81%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	81%	3	73.0%	2	80%	3
CO2	81%	3	71.9%	2	80%	3
CO3	81%	3	66.7%	2	80%	3
CO4	81%	3	65.8%	2	80%	3
CO5	81%	3	69.2%	2	79%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME72.1	CO1	2.94	2.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	1.96	1.96	0.98	0.98
C17ME72.2	CO2	3.00	3.00	2.00	0.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	2.00	2.00	1.00	0.00
C17ME72.3	CO3	3.00	3.00	2.00	0.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	2.00	2.00	1.00	0.00
C17ME72.4	CO4	3.00	0.00	2.00	0.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	2.00	2.00	1.00	0.00
C17ME72.5	CO5	2.94	0.00	1.96	0.00	1.96	0.00	0.00	0.00	0.00	0.98	0.00	1.96	1.96	0.98	0.98
DIRECT ATTAINMENT		2.98	2.98	1.99	0.00	1.99	0.00	0.00	0.00	0.00	0.99	0.00	1.98	1.98	0.99	0.98

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.29	2.29	1.53	0.00	1.53	0.00	0.00	0.00	0.00	0.76	0.00	1.53	1.53	0.76	0.76
ASSIGNMENT AND QUIZ	0.60	0.60	0.40	0.00	0.40	0.00	0.00	0.00	0.00	0.20	0.00	0.40	0.40	0.20	0.20
CONTINUOUS INTERNAL EVALUATION	2.38	2.38	1.59	0.00	1.59	0.00	0.00	0.00	0.00	0.79	0.00	1.59	1.59	0.79	0.78
FINAL DIRECT ATTAINMENT	2.43	2.43	1.62	0.00	1.62	0.00	0.00	0.00	0.00	0.81	0.00	1.62	1.62	0.81	0.81

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.43	2.43	1.62	0.00	1.62	0.00	0.00	0.00	0.00	0.81	0.00	1.62	1.62	0.81	0.81
COURSE EXIT SURVEY	2.08	2.12	1.37	0.00	1.37	0.00	0.00	0.00	0.00	0.69	0.00	1.39	1.39	0.69	0.71
FINAL ATTAINMENT	2.39	2.40	1.59	0.00	1.59	0.00	0.00	0.00	0.00	0.80	0.00	1.59	1.59	0.80	0.80
% OF Attainment	79.7	79.9	79.7	0.0	79.7	0.0	0.0	0.0	0.0	79.7	0.0	79.7	79.7	79.7	79.7

17ME73-CE-A

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

ESTD : 2001 An Institution with a Difference

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2017
SESSION	Aug - Dec 2020
SUBJECT	CE
SEMESTER	7-A
SUB CODE	17ME73

CLASS STRENGTH	51
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage	
Tests IA	Quiz + Assign
100%	0%

CO PO Mapping : At the end of the course the student will be able to

CO1	Apply system modeling knowledge in implementation of physical system.
CO2	Implement block diagram reduction rules and determine the system transfer function using Signal flow graph.
CO3	Determine time domain response and evaluate the steady state error .
CO4	Determine the and assess the stability of the system.
CO5	Develop and model the system and determine its performance in state space domain

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17ME73.1	CO1	2	1	0	0	0	0	0	1	0	0	0	2	2	2	3		
C17ME73.2	CO2	3	2	1	0	0	0	0	1	0	0	0	2	3	2	3		
C17ME73.3	CO3	3	3	1	0	0	0	0	1	0	0	0	1	3	3	3		
C17ME73.4	CO4	3	2	1	0	0	0	0	1	0	0	0	1	2	2	3		
C17ME73.5	CO5	3	3	1	0	0	0	0	1	0	0	0	2	1	1	2		
CO - PO LEVEL		2.8	2.2	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.6	2.2	2.0	2.8		

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	51	100%
CO2	51	100%
CO3	51	100%
CO4	51	100%
CO5	51	100%

Targets for SEE			Targets for InA		
ABOVE	60%	3	75%	3	
ABOVE	50%	2	60%	2	
ABOVE	45%	1	45%	1	

COURSE OUTCOMES	CO ATTAINMENT LEVEL IA		SEE		FINAL		INDIRECT		TA	
CO1	100%	3	53%	2	62%	2.2	69%	2	63%	2
CO2	100%	3	53%	2	62%	2.2	67%	2	63%	2
CO3	100%	3	53%	2	62%	2.2	68%	2	63%	2
CO4	100%	3	53%	2	62%	2.2	63%	2	62%	2
CO5	100%	3	53%	2	62%	2.2	62%	2	62%	2

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17ME73.1	CO1	2.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	2.00	2.00	2.00	3.00		
C17ME73.2	CO2	3.00	2.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	2.00	3.00	2.00	3.00		
C17ME73.3	CO3	3.00	3.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	3.00	3.00	3.00		
C17ME73.4	CO4	3.00	2.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	2.00	2.00	3.00		
C17ME73.5	CO5	3.00	3.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	2.00	1.00	1.00	2.00		
DIRECT ATTAINMENT		2.80	2.20	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.60	2.20	2.00	2.80		

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
SEMESTER END EXAMINATION	1.48	1.16	0.53	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.85	1.16	1.06	1.48		
ASSIGNMENT AND QUIZ\	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
CONTINUOUS INTERNAL EVALUATION	2.80	2.20	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.60	2.20	2.00	2.80		
FINAL DIRECT ATTAINMENT	1.75	1.37	0.62	0.00	0.00	0.00	0.00	0.62	0.00	0.00	0.00	1.00	1.37	1.25	1.75		

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
FINAL DIRECT ATTAINMENT	1.75	1.37	0.62	0.00	0.00	0.00	0.00	0.62	0.00	0.00	0.00	1.00	1.37	1.25	1.75		
PROGRAM EXIT SURVEY	1.84	1.44	0.65	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	1.05	1.46	1.33	1.85		
FINAL ATTAINMENT	1.75	1.38	0.63	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	1.00	1.38	1.26	1.76		

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	CSB

BATCH	2016-2017
SESSION	Sept 2020 To December 2020
SUBJECT	CONTROL ENGG
SEMESTER	7
SUB CODE	17ME73

CLASS STRENGTH	53
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Apply system modeling knowledge in implementation of physical system.
CO2	Implement block diagram reduction rules and determine the system transfer function using Signal flow graph.
CO3	Determine time domain response and evaluate the steady state error .
CO4	Determine the and assess the stability of the system.
CO5	Develop and model the system and determine its performance in state space domain

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME73.1	CO1	2	1	0	0	0	0	0	1	0	0	0	2	2	2	3
C17ME73.2	CO2	3	2	1	0	0	0	0	1	0	0	0	2	3	2	3
C17ME73.3	CO3	3	3	1	0	0	0	0	1	0	0	0	1	3	3	3
C17ME73.4	CO4	3	2	1	0	0	0	0	1	0	0	0	1	2	2	3
C17ME73.5	CO5	3	3	1	0	0	0	0	1	0	0	0	2	1	1	2
CO - PO LEVEL		2.8	2.2	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.6	2.2	2.0	2.8

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			S E E	Final Direct C O % Attainment
Target>=60				
CO1	53	100.00%	49%	59%
CO2	52	98.11%	49%	59%
CO3	52	100.00%	49%	59%
CO4	52	100.00%	49%	59%
CO5	52	100.00%	49%	59%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	59%	1	69.2%	2	60%	2
CO2	59%	1	66.7%	2	60%	1
CO3	59%	1	68.4%	2	60%	2
CO4	59%	1	63.2%	2	60%	1
CO5	59%	1	61.5%	2	60%	1

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME73.1	CO1	2.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	2.00	2.00	2.00	3.00
C17ME73.2	CO2	2.94	1.96	0.98	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	1.96	2.94	1.96	2.94
C17ME73.3	CO3	3.00	3.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	3.00	3.00	3.00
C17ME73.4	CO4	3.00	2.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	2.00	2.00	3.00
C17ME73.5	CO5	3.00	3.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	2.00	1.00	1.00	2.00
DIRECT ATTAINMENT		2.79	2.19	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.59	2.19	1.99	2.79

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.38	1.08	0.49	0.00	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.79	1.08	0.98	1.38
ASSIGNMENT AND QUIZ	0.54	0.42	0.19	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.31	0.42	0.38	0.54
CONTINUOUS INTERNAL EVALUATION	2.23	1.75	0.80	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	1.27	1.75	1.59	2.23
FINAL DIRECT ATTAINMENT	1.65	1.30	0.59	0.00	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.95	1.30	1.18	1.65

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.65	1.30	0.59	0.00	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.95	1.30	1.18	1.65
COURSE EXIT SURVEY	1.84	1.44	0.65	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	1.05	1.46	1.33	1.85
FINAL ATTAINMENT	1.67	1.31	0.60	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.96	1.32	1.20	1.67
% OF Attainment	59.7	59.7	59.7	0.0	0.0	0.0	0.0	59.8	0.0	0.0	0.0	59.8	59.8	59.8	59.8

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	RR

BATCH	2016-2017
SESSION	Sept 2020 To December 2020
SUBJECT	CONTROL ENGG
SEMESTER	7B
SUB CODE	17ME73

CLASS STRENGTH	51
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	45
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Apply system modeling knowledge in implementation of physical system.
CO2	Implement block diagram reduction rules and determine the system transfer function using Signal flow graph.
CO3	Determine time domain response and evaluate the steady state error .
CO4	Determine the and assess the stability of the system.
CO5	Develop and model the system and determine its performance in state space domain

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME73.1	CO1	2	1	0	0	0	0	0	1	0	0	0	2	2	2	3
C17ME73.2	CO2	3	2	1	0	0	0	0	1	0	0	0	2	3	2	3
C17ME73.3	CO3	3	3	1	0	0	0	0	1	0	0	0	1	3	3	3
C17ME73.4	CO4	3	2	1	0	0	0	0	1	0	0	0	1	2	2	3
C17ME73.5	CO5	3	3	1	0	0	0	0	1	0	0	0	2	1	1	2
CO - PO LEVEL		2.8	2.2	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.6	2.2	2.0	2.8

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			S E E	Final Direct C O % Attainment
Target>=60				
CO1	50	100.00%	45%	56%
CO2	50	98.04%	45%	56%
CO3	50	100.00%	45%	56%
CO4	43	86.00%	45%	53%
CO5	49	98.00%	45%	56%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	56%	1	69.2%	2	57%	1
CO2	56%	1	66.6%	2	57%	1
CO3	56%	1	68.4%	2	57%	1
CO4	53%	1	63.2%	2	54%	1
CO5	56%	1	61.5%	2	56%	1

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME73.1	CO1	2.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	2.00	2.00	2.00	3.00
C17ME73.2	CO2	2.94	1.96	0.98	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	1.96	2.94	1.96	2.94
C17ME73.3	CO3	3.00	3.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	3.00	3.00	3.00
C17ME73.4	CO4	2.58	1.72	0.86	0.00	0.00	0.00	0.00	0.86	0.00	0.00	0.00	0.86	1.72	1.72	2.58
C17ME73.5	CO5	2.94	2.94	0.98	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	1.96	0.98	0.98	1.96
DIRECT ATTAINMENT		2.69	2.12	0.96	0.00	0.00	0.00	0.00	0.96	0.00	0.00	0.00	1.56	2.13	1.93	2.70

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.27	0.99	0.45	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.72	0.99	0.90	1.27
ASSIGNMENT AND QUIZ	0.54	0.42	0.19	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.31	0.42	0.38	0.54
CONTINUOUS INTERNAL EVALUATION	2.15	1.70	0.76	0.00	0.00	0.00	0.00	0.77	0.00	0.00	0.00	1.24	1.70	1.55	2.16
FINAL DIRECT ATTAINMENT	1.55	1.22	0.55	0.00	0.00	0.00	0.00	0.55	0.00	0.00	0.00	0.89	1.22	1.11	1.55

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.55	1.22	0.55	0.00	0.00	0.00	0.00	0.55	0.00	0.00	0.00	0.89	1.22	1.11	1.55
COURSE EXIT SURVEY	1.84	1.44	0.65	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	1.05	1.46	1.33	1.85
FINAL ATTAINMENT	1.58	1.24	0.56	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.91	1.25	1.13	1.58
% OF Attainment	56.4	56.4	56.3	0.0	0.0	0.0	0.0	56.5	0.0	0.0	0.0	56.6	56.6	56.6	56.5

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	#REF!

BATCH	2020 -2021
SESSION	August 2020 To December 2021
SUBJECT	Tribology
SEMESTER	7
SUB CODE	17ME742

CLASS STRENGTH	84
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	To Describe the fundamentals of tribology and associated parameters.
CO2	To Apply concepts of tribology for the performance analysis and design of components experiencing relative motion.
CO3	To Analyse the requirements and design hydrodynamic journal bearings for a given application.
CO4	To analyse the requirements and design of and plane slider bearings for a given application.
CO5	To select proper bearing materials and lubricants, principles of surface engineering for different applications of tribology.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME742.1	CO1	3	0	0	0	0	1	0	1	0	2	0	2	1	0	2
C17ME742.2	CO2	3	1	1	0	0	0	0	1	0	2	0	2	1	1	1
C17ME742.3	CO3	3	2	1	0	0	0	0	1	2	1	0	1	2	1	1
C17ME742.4	CO4	3	2	1	0	0	0	0	1	2	1	0	1	2	1	1
C17ME742.5	CO5	3	1	1	0	0	1	0	1	0	1	0	1	2	0	2
CO - PO LEVEL		3.0	1.5	1.0	0.0	0.0	1.0	0.0	1.0	2.0	1.4	0.0	1.4	1.6	1.0	1.4

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct C O % Attainment
CO1	84	98.82%	93%	94%
CO2	83	97.65%	93%	94%
CO3	85	100.00%	93%	94%
CO4	84	100.00%	93%	94%
CO5	85	100.00%	93%	94%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	94%	3	86.2%	3	93%	3
CO2	94%	3	76.3%	3	92%	3
CO3	94%	3	76.3%	3	92%	3
CO4	94%	3	74.8%	2	92%	3
CO5	94%	3	79.3%	3	93%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME742.1	CO1	2.96	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	1.98	0.00	1.98	0.99	0.00	1.98
C17ME742.2	CO2	2.93	0.98	0.98	0.00	0.00	0.00	0.00	0.98	0.00	1.95	0.00	1.95	0.98	0.98	0.98
C17ME742.3	CO3	3.00	2.00	1.00	0.00	0.00	0.00	0.00	1.00	2.00	1.00	0.00	1.00	2.00	1.00	1.00
C17ME742.4	CO4	3.00	2.00	1.00	0.00	0.00	0.00	0.00	1.00	2.00	1.00	0.00	1.00	2.00	1.00	1.00
C17ME742.5	CO5	3.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	2.00	0.00	2.00
DIRECT ATTAINMENT		2.98	1.49	0.99	0.00	0.00	0.99	0.00	0.99	2.00	1.39	0.00	1.39	1.59	0.99	1.39

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.79	1.39	0.93	0.00	0.00	0.93	0.00	0.93	1.86	1.30	0.00	1.30	1.49	0.93	1.30
ASSIGNMENT AND QUIZ	0.60	0.30	0.20	0.00	0.00	0.20	0.00	0.20	0.40	0.28	0.00	0.28	0.32	0.20	0.28
CONTINUOUS INTERNAL EVALUATION	2.38	1.20	0.80	0.00	0.00	0.80	0.00	0.79	1.60	1.11	0.00	1.11	1.27	0.79	1.11
FINAL DIRECT ATTAINMENT	2.83	1.41	0.94	0.00	0.00	0.94	0.00	0.94	1.89	1.32	0.00	1.32	1.51	0.94	1.32

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.83	1.41	0.94	0.00	0.00	0.94	0.00	0.94	1.89	1.32	0.00	1.32	1.51	0.94	1.32
COURSE EXIT SURVEY	2.36	1.14	0.77	0.00	0.00	0.83	0.00	0.79	1.51	1.11	0.00	1.11	1.25	0.76	1.12
FINAL ATTAINMENT	2.78	1.39	0.92	0.00	0.00	0.93	0.00	0.93	1.85	1.30	0.00	1.30	1.48	0.92	1.30
% OF Attainment	92.6	92.4	92.4	0.0	0.0	93.0	0.0	92.6	92.4	92.6	0.0	92.6	92.6	92.3	92.7

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	VR

BATCH	2020 -2021
SESSION	August 2020 To Jan 2021
SUBJECT	Financial Management
SEMESTER	7ABC
SUB CODE	17ME743

CLASS STRENGTH	55
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand various accounts, taxex , prfeparation of balance sheet
CO2	understand Operating cycle/ cash cycle , calculation of gross working capital and net working capital
CO3	Understand various factors affecting investment decisions, capital budegting
CO4	Able to calculate risk and returns of portfolios, understand various types of financial ratios
CO5	Understand the preparation of cost sheet and variences of cost and preparing various types of budgets

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME743.1	CO1	2	2			1	2		1		2		3	1		1
C17ME743.2	CO2	2	2				2			3	3		3	1		1
C17ME743.3	CO3	2	2				2			2	3		3	1		1
C17ME743.4	CO4	3	2			1			1	1	3		3	1		1
C17ME743.5	CO5	3	2			1			1	1	3		3	1		1
CO - PO LEVEL		2.4	2.0	0.0	0.0	1.0	2.0	0.0	1.0	1.8	2.8	0.0	3.0	1.0	0.0	1.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct C O % Attainment
CO1	55	100.00%	78%	82%
CO2	55	100.00%	78%	82%
CO3	55	100.00%	78%	82%
CO4	55	100.00%	78%	82%
CO5	55	100.00%	78%	82%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	82%	3	65.3%	2	81%	3
CO2	82%	3	64.2%	2	81%	3
CO3	82%	3	65.4%	2	81%	3
CO4	82%	3	64.2%	2	81%	3
CO5	82%	3	65.4%	2	81%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME743.1	CO1	2.00	2.00	0.00	0.00	1.00	2.00	0.00	1.00	0.00	2.00	0.00	3.00	1.00	0.00	1.00
C17ME743.2	CO2	2.00	2.00	0.00	0.00	0.00	2.00	0.00	0.00	3.00	3.00	0.00	3.00	1.00	0.00	1.00
C17ME743.3	CO3	2.00	2.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	3.00	0.00	3.00	1.00	0.00	1.00
C17ME743.4	CO4	3.00	2.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	3.00	0.00	3.00	1.00	0.00	1.00
C17ME743.5	CO5	3.00	2.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	3.00	0.00	3.00	1.00	0.00	1.00
DIRECT ATTAINMENT		2.40	2.00	0.00	0.00	1.00	2.00	0.00	1.00	1.75	2.80	0.00	3.00	1.00	0.00	1.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.87	1.56	0.00	0.00	0.78	1.56	0.00	0.78	1.37	2.18	0.00	2.34	0.78	0.00	0.78
ASSIGNMENT AND QUIZ	0.48	0.40	0.00	0.00	0.20	0.40	0.00	0.20	0.35	0.56	0.00	0.60	0.20	0.00	0.20
CONTINUOUS INTERNAL EVALUATION	1.92	1.60	0.00	0.00	0.80	1.60	0.00	0.80	1.40	2.24	0.00	2.40	0.80	0.00	0.80
FINAL DIRECT ATTAINMENT	1.98	1.65	0.00	0.00	0.82	1.65	0.00	0.82	1.44	2.31	0.00	2.47	0.82	0.00	0.82

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.98	1.65	0.00	0.00	0.82	1.65	0.00	0.82	1.44	2.31	0.00	2.47	0.82	0.00	0.82
COURSE EXIT SURVEY	1.56	1.30	0.00	0.00	0.65	1.30	0.00	0.65	1.13	1.82	0.00	1.95	0.65	0.00	0.65
FINAL ATTAINMENT	1.94	1.61	0.00	0.00	0.81	1.61	0.00	0.81	1.41	2.26	0.00	2.42	0.81	0.00	0.81
% OF Attainment	80.7	80.7	0.0	0.0	80.7	80.7	0.0	80.7	80.6	80.7	0.0	80.7	80.7	0.0	80.7

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	SK

BATCH	2020 -2021
SESSION	April 2021 To July 2021
SUBJECT	SMART MATERIALS
SEMESTER	7ABC
SUB CODE	17ME745

CLASS STRENGTH	19
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand the meaning, definitions, scope, need, phases and techniques of operations research. Formulate as L.P.P and derive optimal solutions to linear programming problems by graphical method, Simplex method, Big-M method and Dual Simplex method
CO2	Formulate as Transportation and Assignment problems and derive optimum solutions for transportation, Assignment and travelling salesman problems. Solve problems on game theory for pure and mixed strategy under competitive environment.
CO3	Solve waiting line problems for M/M/1 and M/M/K queuing models.
CO4	Construct network diagrams and determine critical path, floats for deterministic and PERT networks including crashing of Networks
CO5	Determine minimum processing times for sequencing of n jobs-2 machines, n jobs-3 machines, n jobs-m machines and 2 jobs-n machines using Johnson's algorithm

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME745.1	CO1	3	3	2	0	0	1	1	0	0	1	0	1	1	1	0
C17ME745.2	CO2	3	2	2	0	0	1	1	0	0	0	0	1	1	1	0
C17ME745.3	CO3	3	2	0	0	0	0	0	0	0	0	1	1	1	1	0
C17ME745.4	CO4	3	2	2	0	0	2	0	0	0	0	0	1	1	1	0
C17ME745.5	CO5	3	2	2	0	0	1	0	0	0	0	0	1	1	1	0
CO - PO LEVEL		3.0	2.2	2.0	0.0	0.0	1.3	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			S E E	Final Direct C O % Attainment
CO1	21	100.00%	100%	100%
CO2	24	100.00%	100%	100%
CO3	21	100.00%	100%	100%
CO4	21	100.00%	100%	100%
CO5	21	100.00%	100%	100%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	100%	3	80.5%	3	100%	3
CO2	10%	3	77.3%	3	100%	3
CO3	100%	3	74.2%	2	100%	3
CO4	100%	3	74.3%	2	100%	3
CO5	100%	3	78.4%	3	100%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME745.1	CO1	3.00	3.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
C17ME745.2	CO2	3.00	2.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
C17ME745.3	CO3	3.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00
C17ME745.4	CO4	3.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
C17ME745.5	CO5	3.00	2.00	2.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
DIRECT ATTAINMENT		3.00	2.20	2.00	0.00	0.00	1.25	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	3.15	2.31	2.10	0.00	0.00	1.31	1.05	0.00	0.00	1.05	1.05	1.05	1.05	1.05	0.00
ASSIGNMENT AND QUIZ	0.63	0.46	0.42	0.00	0.00	0.26	0.21	0.00	0.00	0.21	0.21	0.21	0.21	0.21	0.00
CONTINUOUS INTERNAL EVALUATION	2.40	1.76	1.60	0.00	0.00	1.00	0.80	0.00	0.00	0.80	0.80	0.80	0.80	0.80	0.00
FINAL DIRECT ATTAINMENT	3.12	2.29	2.08	0.00	0.00	1.30	1.04	0.00	0.00	1.04	1.04	1.04	1.04	1.04	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	3.00	2.29	2.08	0.00	0.00	1.30	1.04	0.00	0.00	1.04	1.04	1.04	1.04	1.04	0.00
COURSE EXIT SURVEY	2.31	0.08	0.07	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.04	0.04	0.04	0.00
FINAL ATTAINMENT	2.93	2.07	1.88	0.00	0.00	1.18	0.94	0.00	0.00	0.94	0.94	0.94	0.94	0.94	0.00
% OF Attainment	97.7	94.0	94.0	0.0	0.0	94.0	94.0	0.0	0.0	94.0	94.0	94.0	94.0	94.0	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	RG

BATCH	2020 -2021
SESSION	August 2019 To December 2019
SUBJECT	Mechatronics
SEMESTER	7 B
SUB CODE	17ME754

CLASS STRENGTH	53
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	To provide insight to students on the fundamentals of interdisciplinary engineering components and their integration in Mechatronic systems design approach.
CO2	To impart the knowledge of Microprocessors, Microcontrollers, and its role in Mechatronic systems
CO3	To understand the concept of PLC system and its ladder programming and integration in Mechatronics system.
CO4	To familiarize the fundamentals for selection of Mechanical and Electrical actuation system in designing of mechatronics system.
CO5	To impart the knowledge on Pneumatic, Hydraulic actuation system , DCV & FCV in designing of mechatronics system.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME754.1	CO1	3	0	0	0	2	1	1	1	0	1	1	0	0	0	0
C17ME754.2	CO2	2	2	1	0	0	1	0	1	0	1	1	0	0	0	0
C17ME754.3	CO3	3	0	2	1	2	1	0	1	0	1	1	0	0	0	0
C17ME754.4	CO4	2	3	0	0	2	0	2	1	0	1	1	0	0	0	0
C17ME754.5	CO5	3	2	0	2	2	0	0	1	0	1	1	0	0	0	0
CO - PO LEVEL		2.6	2.3	1.5	1.5	2.0	1.0	1.5	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	6	46.15%	89%	80%
CO2	7	58.33%	89%	83%
CO3	40	93.02%	89%	90%
CO4	37	88.10%	89%	89%
CO5	32	94.12%	89%	90%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	80%	3	71.8%	2	79%	3
CO2	83%	3	70.2%	2	81%	3
CO3	90%	3	68.3%	2	88%	3
CO4	89%	3	66.7%	2	87%	3
CO5	90%	3	68.4%	2	88%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME754.1	CO1	1.38	0.00	0.00	0.00	0.92	0.46	0.46	0.46	0.00	0.46	0.46	0.00	0.00	0.00	0.00
C17ME754.2	CO2	1.17	1.17	0.58	0.00	0.00	0.58	0.00	0.58	0.00	0.58	0.58	0.00	0.00	0.00	0.00
C17ME754.3	CO3	2.79	0.00	1.86	0.93	1.86	0.93	0.00	0.93	0.00	0.93	0.93	0.00	0.00	0.00	0.00
C17ME754.4	CO4	1.76	2.64	0.00	0.00	1.76	0.00	1.76	0.88	0.00	0.88	0.88	0.00	0.00	0.00	0.00
C17ME754.5	CO5	2.82	1.88	0.00	1.88	1.88	0.00	0.00	0.94	0.00	0.94	0.94	0.00	0.00	0.00	0.00
DIRECT ATTAINMENT		1.99	1.90	1.22	1.41	1.61	0.66	1.11	0.76	0.00	0.76	0.76	0.00	0.00	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.31	2.07	1.33	1.33	1.78	0.89	1.33	0.89	0.00	0.89	0.89	0.00	0.00	0.00	0.00
ASSIGNMENT AND QUIZ	0.51	0.46	0.29	0.29	0.39	0.20	0.29	0.20	0.00	0.20	0.20	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	1.59	1.52	0.98	1.13	1.29	0.53	0.89	0.61	0.00	0.61	0.61	0.00	0.00	0.00	0.00
FINAL DIRECT ATTAINMENT	2.27	2.05	1.32	1.35	1.76	0.86	1.30	0.87	0.00	0.87	0.87	0.00	0.00	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.27	2.05	1.32	1.35	1.76	0.86	1.30	0.87	0.00	0.87	0.87	0.00	0.00	0.00	0.00
COURSE EXIT SURVEY	1.80	1.59	1.03	1.03	1.38	0.70	1.03	0.69	0.00	0.69	0.69	0.00	0.00	0.00	0.00
FINAL ATTAINMENT	2.22	2.01	1.29	1.32	1.72	0.84	1.27	0.85	0.00	0.85	0.85	0.00	0.00	0.00	0.00
% OF Attainment	85.4	86.0	86.1	87.8	85.9	84.0	85.0	85.3	0.0	85.3	85.3	0.0	0.0	0.0	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	VU

BATCH	2019-2020
SESSION	AUG 2019To DEC 2019
SUBJECT	MTR
SEMESTER	7
SUB CODE	17MEL754

CLASS STRENGTH	115
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	To provide insight to students on the fundamentals of interdisciplinary engineering components and their integration in Mechatronic systems design approach.
CO2	To impart the knowledge of Microprocessors, Microcontrollers, and its role in Mechatronic systems
CO3	To understand the concept of PLC system and its ladder programming and integration in Mechatronics system.
CO4	To familiarize the fundamentals for selection of Mechanical and Electrical actuation system in designing of mechatronics system.
CO5	To impart the knowledge on Pneumatic, Hydraulic actuation system , DCV & FCV in designing of mechatronics system.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MEL754.1	CO1	3	0	0	0	2	1	1	1	0	1	1	0	0	0	0
C17MEL754.2	CO2	2	2	1	0	0	1	0	1	0	1	1	0	0	0	0
C17MEL754.3	CO3	3	0	2	1	2	1	0	1	0	1	1	0	0	0	0
C17MEL754.4	CO4	2	3	0	0	2	0	2	1	0	1	1	0	0	0	0
C17MEL754.5	CO5	3	2	0	2	2	0	0	1	0	1	1	0	0	0	0
CO - PO LEVEL		2.6	2.3	1.5	1.5	2.0	1.0	1.5	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	98	89.91%	79%	81%
CO2	98	89.91%	79%	81%
CO3	98	89.91%	79%	81%
CO4	98	89.91%	79%	81%
CO5	98	89.91%	79%	81%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	81%	3	72.0%	2	80%	3
CO2	81%	3	70.0%	2	80%	3
CO3	81%	3	68.1%	2	80%	3
CO4	81%	3	66.7%	2	80%	3
CO5	81%	3	68.4%	2	80%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MEL754.1	CO1	2.70	0.00	0.00	0.00	1.80	0.90	0.90	0.90	0.00	0.90	0.90	0.00	0.00	0.00	0.00
C17MEL754.2	CO2	1.80	1.80	0.90	0.00	0.00	0.90	0.00	0.90	0.00	0.90	0.90	0.00	0.00	0.00	0.00
C17MEL754.3	CO3	2.70	0.00	1.80	0.90	1.80	0.90	0.00	0.90	0.00	0.90	0.90	0.00	0.00	0.00	0.00
C17MEL754.4	CO4	1.80	2.70	0.00	0.00	1.80	0.00	1.80	0.90	0.00	0.90	0.90	0.00	0.00	0.00	0.00
C17MEL754.5	CO5	2.70	1.80	0.00	1.80	1.80	0.00	0.00	0.90	0.00	0.90	0.90	0.00	0.00	0.00	0.00
DIRECT ATTAINMENT		2.34	2.10	1.35	1.35	1.80	0.90	1.35	0.90	0.00	0.90	0.90	0.00	0.00	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.06	1.85	1.19	1.19	1.58	0.79	1.19	0.79	0.00	0.79	0.79	0.00	0.00	0.00	0.00
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	1.87	1.68	1.08	1.08	1.44	0.72	1.08	0.72	0.00	0.72	0.72	0.00	0.00	0.00	0.00
FINAL DIRECT ATTAINMENT	2.02	1.81	1.17	1.17	1.55	0.78	1.17	0.78	0.00	0.78	0.78	0.00	0.00	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.02	1.81	1.17	1.17	1.55	0.78	1.17	0.78	0.00	0.78	0.78	0.00	0.00	0.00	0.00
COURSE EXIT SURVEY	1.80	1.59	1.03	1.02	1.38	0.70	1.03	0.69	0.00	0.69	0.69	0.00	0.00	0.00	0.00
FINAL ATTAINMENT	2.00	1.79	1.15	1.15	1.54	0.77	1.15	0.77	0.00	0.77	0.77	0.00	0.00	0.00	0.00
% OF Attainment	76.8	76.7	76.8	76.8	76.8	76.9	76.8	76.8	0.0	76.8	76.8	0.0	0.0	0.0	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	0

BATCH	2020-2021
SESSION	September 2020 to December 2020
SUBJECT	CIM LAB
SEMESTER	7
SUB CODE	17MEL77

CLASS STRENGTH	154
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
100%	0%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Develop fundamental skills to write manual part programming for various CNC Lathe operations
CO2	Develop knowledge to write manual part programming for various turning operations. Operations.Generate CNC Mill Part programming for Point to point motions, Line motions, Circular interpolation, Contour motion, Pocket milling- circular, rectangular, Mirror commands etc.
CO3	Evaluate the Use of Canned Cycles for Drilling, Peck drilling, Boring, Tapping, Turning, Facing,Taper turning Thread cutting etc.
CO4	Analyze for the design and analysis of Robotics and FMS
CO5	Analyze hydraulics software for the design and analysis of hydraulic circuits

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MEL77.1	CO1	3	3	0	3	0	2	2	3	0	0	0	0	3	3	2
C17MEL77.2	CO2	3	3	0	3	0	2	0	0	0	0	0	0	3	3	2
C17MEL77.3	CO3	3	3	0	3	3	3	3	3	0	2	0	3	3	3	3
C17MEL77.4	CO4	3	2	0	2	2	2	3	2	0	2	0	3	2	2	3
C17MEL77.5	CO5	3	2	0	2	2	2	3	2	0	2	0	3	2	2	3
CO - PO LEVEL		3.0	2.6	0.0	2.6	2.3	2.2	2.8	2.5	0.0	2.0	0.0	3.0	2.6	2.6	2.6

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			S E E	Final Direct C O % Attainment
CO1	154	100.00%	99%	99%
CO2	154	100.00%	99%	99%
CO3	154	100.00%	99%	99%
CO4	154	100.00%	99%	99%
CO5	154	100.00%	99%	99%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	99%	3	69.3%	2	96%	3
CO2	99%	3	62.3%	2	95%	3
CO3	99%	3	63.2%	2	95%	3
CO4	99%	3	65.8%	2	96%	3
CO5	99%	3	65.8%	2	96%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17MEL77.1	CO1	3.00	3.00	0.00	3.00	0.00	2.00	2.00	3.00	0.00	0.00	0.00	0.00	3.00	3.00	2.00
C17MEL77.2	CO2	3.00	3.00	0.00	3.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	3.00	2.00
C17MEL77.3	CO3	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	0.00	2.00	0.00	3.00	3.00	3.00	3.00
C17MEL77.4	CO4	3.00	2.00	0.00	2.00	2.00	2.00	3.00	2.00	0.00	2.00	0.00	3.00	2.00	2.00	3.00
C17MEL77.5	CO5	3.00	2.00	0.00	2.00	2.00	2.00	3.00	2.00	0.00	2.00	0.00	3.00	2.00	2.00	3.00
DIRECT ATTAINMENT		3.00	2.60	0.00	2.60	2.33	2.20	2.75	2.50	0.00	2.00	0.00	3.00	2.60	2.60	2.60

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.96	2.57	0.00	2.57	2.30	2.17	2.71	2.47	0.00	1.97	0.00	2.96	2.57	2.57	2.57
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	3.00	2.60	0.00	2.60	2.33	2.20	2.75	2.50	0.00	2.00	0.00	3.00	2.60	2.60	2.60
FINAL DIRECT ATTAINMENT	2.97	2.57	0.00	2.57	2.31	2.18	2.72	2.47	0.00	1.98	0.00	2.97	2.57	2.57	2.57

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.97	2.57	0.00	2.57	2.31	2.18	2.72	2.47	0.00	1.98	0.00	2.97	2.57	2.57	2.57
COURSE EXIT SURVEY	1.96	1.69	0.00	1.69	1.51	1.43	1.81	1.65	0.00	1.30	0.00	1.95	1.69	1.69	1.69
FINAL ATTAINMENT	2.87	2.49	0.00	2.49	2.23	2.10	2.63	2.39	0.00	1.91	0.00	2.87	2.49	2.49	2.49
% OF Attainment	95.6	95.6	0.0	95.6	95.5	95.6	95.6	95.7	0.0	95.6	0.0	95.6	95.6	95.6	95.6

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	0

BATCH	2019-2020
SESSION	AUG 2019To DEC 2019
SUBJECT	DESIGN LAB
SEMESTER	7
SUB CODE	15MEL76

CLASS STRENGTH	154
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	40
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
100%	0%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Apply the essence of kinetics and dynamics through experiments.
CO2	Analyze the stresses developed in an object through photo elasticity implementation and concept of stress concentration in design.
CO3	Apply the flow pressure distribution across and along the Journal bearing.
CO4	Analyze experiments to obtain the mechanical behaviour Strain guges
CO5	Analyze experiments to obtain the mechanical behaviour strain rosetts and gyroscope.

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C15MEL76.1	CO1	3	3	3	3	0	1	0	0	0	0	0	0	3	2	2
C15MEL76.2	CO2	3	2	3	1	0	1	0	0	0	0	0	0	3	2	2
C15MEL76.3	CO3	2	2	3	3	0	1	0	0	0	0	0	0	3	2	2
C15MEL76.4	CO4	2	2	3	1	0	1	0	0	0	0	0	0	3	3	3
C15MEL76.5	CO5	2	2	3	1	0	1	0	0	0	0	0	0	3	3	3
CO - PO LEVEL		2.4	2.2	3.0	1.8	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	2.4	2.4

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct C O % Attainment
CO1	154	100.00%	96%	97%
CO2	154	100.00%	96%	97%
CO3	154	100.00%	96%	97%
CO4	154	100.00%	96%	97%
CO5	154	100.00%	96%	97%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	97%	3	64.8%	2	94%	3
CO2	97%	3	64.9%	2	94%	3
CO3	97%	3	64.9%	2	94%	3
CO4	97%	3	63.2%	2	94%	3
CO5	97%	3	64.0%	2	94%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C15MEL76.1	CO1	3.00	3.00	3.00	3.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	2.00	2.00
C15MEL76.2	CO2	3.00	2.00	3.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	2.00	2.00
C15MEL76.3	CO3	2.00	2.00	3.00	3.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	2.00	2.00
C15MEL76.4	CO4	2.00	2.00	3.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	3.00	3.00
C15MEL76.5	CO5	2.00	2.00	3.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	3.00	3.00
DIRECT ATTAINMENT		2.40	2.20	3.00	1.80	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	2.40	2.40

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.31	2.11	2.88	1.73	0.00	0.96	0.00	0.00	0.00	0.00	0.00	0.00	2.88	2.31	2.31
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	2.40	2.20	3.00	1.80	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	2.40	2.40
FINAL DIRECT ATTAINMENT	2.33	2.13	2.91	1.74	0.00	0.97	0.00	0.00	0.00	0.00	0.00	0.00	2.91	2.33	2.33

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.33	2.13	2.91	1.74	0.00	0.97	0.00	0.00	0.00	0.00	0.00	0.00	2.91	2.33	2.33
COURSE EXIT SURVEY	1.55	1.42	1.93	1.16	0.00	0.64	0.00	0.00	0.00	0.00	0.00	0.00	1.93	1.54	1.54
FINAL ATTAINMENT	2.25	2.06	2.81	1.69	0.00	0.94	0.00	0.00	0.00	0.00	0.00	0.00	2.81	2.25	2.25
% OF Attainment	93.6	93.6	93.6	93.7	0.0	93.6	0.0	0.0	0.0	0.0	0.0	0.0	93.6	93.6	93.6

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	LBW

BATCH	2020 -2021
SESSION	April 2021 To July 2021
SUBJECT	Operations Research
SEMESTER	7C
SUB CODE	17ME81

CLASS STRENGTH	51
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand the meaning, definitions, scope, need, phases and techniques of operations research. Formulate as L.P.P and derive optimal solutions to linear programming problems by graphical method, Simplex method, Big-M method and Dual Simplex method
CO2	Formulate as Transportation and Assignment problems and derive optimum solutions for transportation, Assignment and travelling salesman problems. Solve problems on game theory for pure and mixed strategy under competitive environment.
CO3	Solve waiting line problems for M/M/1 and M/M/K queuing models.
CO4	Construct network diagrams and determine critical path, floats for deterministic and PERT networks including crashing of Networks
CO5	Determine minimum processing times for sequencing of n jobs-2 machines, n jobs-3 machines, n jobs-m machines and 2 jobs-n machines using Johnson's algorithm

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME81.1	CO1	3	3	2	0	0	1	1	0	0	1	0	1	1	1	0
C17ME81.2	CO2	3	2	2	0	0	1	1	0	0	0	0	1	1	1	0
C17ME81.3	CO3	3	2	0	0	0	0	0	0	0	0	1	1	1	1	0
C17ME81.4	CO4	3	2	2	0	0	2	0	0	0	0	0	1	1	1	0
C17ME81.5	CO5	3	2	2	0	0	1	0	0	0	0	0	1	1	1	0
CO - PO LEVEL		3.0	2.2	2.0	0.0	0.0	1.3	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	51	100.00%	78%	83%
CO2	49	96.08%	78%	82%
CO3	48	94.12%	78%	81%
CO4	50	98.04%	78%	82%
CO5	51	100.00%	78%	83%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	83%	3	84.5%	3	83%	3
CO2	82%	3	81.9%	3	82%	3
CO3	81%	3	80.8%	3	81%	3
CO4	82%	3	77.6%	3	82%	3
CO5	83%	3	83.4%	3	83%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME81.1	CO1	3.00	3.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
C17ME81.2	CO2	2.88	1.92	1.92	0.00	0.00	0.96	0.96	0.00	0.00	0.00	0.00	0.96	0.96	0.96	0.00
C17ME81.3	CO3	2.82	1.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.94	0.94	0.94	0.94	0.00
C17ME81.4	CO4	2.94	1.96	1.96	0.00	0.00	1.96	0.00	0.00	0.00	0.00	0.00	0.98	0.98	0.98	0.00
C17ME81.5	CO5	3.00	2.00	2.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
DIRECT ATTAINMENT		2.93	2.15	1.97	0.00	0.00	1.23	0.98	0.00	0.00	1.00	0.94	0.98	0.98	0.98	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.35	1.72	1.57	0.00	0.00	0.98	0.78	0.00	0.00	0.78	0.78	0.78	0.78	0.78	0.00
ASSIGNMENT AND QUIZ	0.59	0.43	0.39	0.00	0.00	0.25	0.20	0.00	0.00	0.20	0.20	0.20	0.20	0.20	0.00
CONTINUOUS INTERNAL EVALUATION	2.34	1.72	1.58	0.00	0.00	0.98	0.78	0.00	0.00	0.80	0.75	0.78	0.78	0.78	0.00
FINAL DIRECT ATTAINMENT	2.47	1.81	1.65	0.00	0.00	1.03	0.82	0.00	0.00	0.83	0.82	0.82	0.82	0.82	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.47	1.81	1.65	0.00	0.00	1.03	0.82	0.00	0.00	0.83	0.82	0.82	0.82	0.82	0.00
COURSE EXIT SURVEY	2.45	1.80	1.64	0.00	0.00	1.01	0.83	0.00	0.00	0.85	0.81	0.82	0.82	0.82	0.00
FINAL ATTAINMENT	2.46	1.81	1.65	0.00	0.00	1.03	0.82	0.00	0.00	0.83	0.82	0.82	0.82	0.82	0.00
% OF Attainment	82.2	82.2	82.3	0.0	0.0	82.2	82.4	0.0	0.0	82.8	81.6	82.2	82.2	82.2	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	CSB

BATCH	2020-2021
SESSION	MARCH 2021 TO JUNE 2021
SUBJECT	OPERATIONS RESEARCH
SEMESTER	8B
SUB CODE	17ME81

CLASS STRENGTH	52
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand the meaning, definitions, scope, need, phases and techniques of operations research. Formulate as L.P.P and derive optimal solutions to linear programming problems by graphical method, Simplex method, Big-M method and Dual Simplex method
CO2	Formulate as Transportation and Assignment problems and derive optimum solutions for transportation, Assignment and travelling salesman problems. Solve problems on game theory for pure and mixed strategy under competitive environment.
CO3	Solve waiting line problems for M/M/1 and M/M/K queuing models.
CO4	Construct network diagrams and determine critical path, floats for deterministic and PERT networks including crashing of Networks
CO5	Determine minimum processing times for sequencing of n jobs-2 machines, n jobs-3 machines, n jobs-m machines and 2 jobs-n machines using Johnson's algorithm

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME81.1	CO1	3	3	2	0	0	1	1	0	0	1	0	1	1	1	0
C17ME81.2	CO2	3	2	2	0	0	1	1	0	0	0	0	1	1	1	0
C17ME81.3	CO3	3	2	0	0	0	0	0	0	0	0	1	1	1	1	0
C17ME81.4	CO4	3	2	2	0	0	2	0	0	0	0	0	1	1	1	0
C17ME81.5	CO5	3	2	2	0	0	1	0	0	0	0	0	1	1	1	0
CO - PO LEVEL		3.0	2.2	2.0	0.0	0.0	1.3	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	52	100.00%	81%	85%
CO2	52	100.00%	81%	85%
CO3	52	100.00%	81%	85%
CO4	52	100.00%	81%	85%
CO5	52	100.00%	81%	85%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	85%	3	84.5%	3	85%	3
CO2	85%	3	81.9%	3	84%	3
CO3	85%	3	80.8%	3	84%	3
CO4	85%	3	77.6%	3	84%	3
CO5	85%	3	83.4%	3	85%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME81.1	CO1	3.00	3.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
C17ME81.2	CO2	3.00	2.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
C17ME81.3	CO3	3.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00
C17ME81.4	CO4	3.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
C17ME81.5	CO5	3.00	2.00	2.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
DIRECT ATTAINMENT		3.00	2.20	2.00	0.00	0.00	1.25	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.43	1.78	1.62	0.00	0.00	1.01	0.81	0.00	0.00	0.81	0.81	0.81	0.81	0.81	0.00
ASSIGNMENT AND QUIZ	0.59	0.43	0.39	0.00	0.00	0.25	0.20	0.00	0.00	0.20	0.20	0.20	0.20	0.20	0.00
CONTINUOUS INTERNAL EVALUATION	2.40	1.76	1.60	0.00	0.00	1.00	0.80	0.00	0.00	0.80	0.80	0.80	0.80	0.80	0.00
FINAL DIRECT ATTAINMENT	2.54	1.86	1.69	0.00	0.00	1.06	0.85	0.00	0.00	0.85	0.85	0.85	0.85	0.85	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.54	1.86	1.69	0.00	0.00	1.06	0.85	0.00	0.00	0.85	0.85	0.85	0.85	0.85	0.00
COURSE EXIT SURVEY	2.45	1.80	1.64	0.00	0.00	1.01	0.83	0.00	0.00	0.85	0.81	0.82	0.82	0.82	0.00
FINAL ATTAINMENT	2.53	1.86	1.69	0.00	0.00	1.05	0.85	0.00	0.00	0.85	0.84	0.84	0.84	0.84	0.00
% OF Attainment	84.4	84.4	84.4	0.0	0.0	84.3	84.5	0.0	0.0	84.6	84.3	84.4	84.4	84.4	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	MJN

BATCH	2020 -2021
SESSION	february 2021 To august 2021
SUBJECT	Operations Research
SEMESTER	7C
SUB CODE	17ME81

CLASS STRENGTH	50
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand the meaning, definitions, scope, need, phases and techniques of operations research. Formulate as L.P.P and derive optimal solutions to linear programming problems by graphical method, Simplex method, Big-M method and Dual Simplex method
CO2	Formulate as Transportation and Assignment problems and derive optimum solutions for transportation, Assignment and travelling salesman problems. Solve problems on game theory for pure and mixed strategy under competitive environment.
CO3	Solve waiting line problems for M/M/1 and M/M/K queuing models.
CO4	Construct network diagrams and determine critical path, floats for deterministic and PERT networks including crashing of Networks
CO5	Determine minimum processing times for sequencing of n jobs-2 machines, n jobs-3 machines, n jobs-m machines and 2 jobs-n machines using Johnson's algorithm

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME81.1	CO1	3	3	2	0	0	1	1	0	0	1	0	1	1	1	0
C17ME81.2	CO2	3	2	2	0	0	1	1	0	0	0	0	1	1	1	0
C17ME81.3	CO3	3	2	0	0	0	0	0	0	0	0	1	1	1	1	0
C17ME81.4	CO4	3	2	2	0	0	2	0	0	0	0	0	1	1	1	0
C17ME81.5	CO5	3	2	2	0	0	1	0	0	0	0	0	1	1	1	0
CO - PO LEVEL		3.0	2.2	2.0	0.0	0.0	1.3	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	50	100.00%	74%	79%
CO2	50	100.00%	74%	79%
CO3	50	100.00%	74%	79%
CO4	50	100.00%	74%	79%
CO5	49	98.00%	74%	79%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	79%	3	84.5%	3	80%	3
CO2	79%	3	81.9%	3	79%	3
CO3	79%	3	80.8%	3	79%	3
CO4	79%	3	77.6%	3	79%	3
CO5	79%	3	83.4%	3	79%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME81.1	CO1	3.00	3.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
C17ME81.2	CO2	3.00	2.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
C17ME81.3	CO3	3.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00
C17ME81.4	CO4	3.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
C17ME81.5	CO5	2.94	1.96	1.96	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.98	0.98	0.98	0.00
DIRECT ATTAINMENT		2.99	2.19	1.99	0.00	0.00	1.25	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.21	1.62	1.47	0.00	0.00	0.92	0.74	0.00	0.00	0.74	0.74	0.74	0.74	0.74	0.00
ASSIGNMENT AND QUIZ	0.60	0.44	0.40	0.00	0.00	0.25	0.20	0.00	0.00	0.20	0.20	0.20	0.20	0.20	0.00
CONTINUOUS INTERNAL EVALUATION	2.39	1.75	1.59	0.00	0.00	1.00	0.80	0.00	0.00	0.80	0.80	0.80	0.80	0.80	0.00
FINAL DIRECT ATTAINMENT	2.37	1.74	1.58	0.00	0.00	0.99	0.79	0.00	0.00	0.79	0.79	0.79	0.79	0.79	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.37	1.74	1.58	0.00	0.00	0.99	0.79	0.00	0.00	0.79	0.79	0.79	0.79	0.79	0.00
COURSE EXIT SURVEY	2.45	1.80	1.64	0.00	0.00	1.01	0.83	0.00	0.00	0.85	0.81	0.82	0.82	0.82	0.00
FINAL ATTAINMENT	2.37	1.74	1.58	0.00	0.00	0.99	0.79	0.00	0.00	0.80	0.79	0.79	0.79	0.79	0.00
% OF Attainment	*79.2*	*79.2*	*79.2*	*0.0*	*0.0*	*79.1*	*79.4*	*0.0*	*0.0*	*79.5*	*79.1*	*79.2*	*79.2*	*79.2*	*0.0*

17ME82-AM-A

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

ESTD : 2001 — An Institution with a Difference

DEPARTMENT OF MECHANICAL ENGINEERING

BATCH	2017
SESSION	february 2021 To august 2021
SUBJECT	AM
SEMESTER	8-A
SUB CODE	17ME82

CLASS STRENGTH	51
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage	
Tests IA	Quiz + Assign
100%	0%

CO PO Mapping : At the end of the course the student will be able to	
CO1	Define Additive manufacturing, understand the different process of Additive Manufacturing and visualize the guidelines provided for AM Process.
CO2	Visualize how a hydraulic/pneumatic and electric actuator will work to accomplish the function.
CO3	Understand the different process of Additive Manufacturing. using Polymer and Powder metallurgy
CO4	Understanding Nano materials and Nano materials manufacturing process. Analyse the different characterization techniques using optical microscopy like SEM, TEM and XRD.
CO5	Describe the various NC, CNC machine programing and Automation techniques

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17ME82.1	CO1	3	2			1	1				1		1	3	1	1		
C17ME82.2	CO2	3	2			1	1				1		1	3	1	1		
C17ME82.3	CO3	3	2			1	1				1		1	3	1	1		
C17ME82.4	CO4	3	2			1	1				1		1	3	1	1		
C17ME82.5	CO5	3	2	2		1	1				1		1	3	2	1		
CO - PO LEVEL		3.0	2.0	2.0	0.0	1.0	1.0	0.0	0.0	0.0	1.0	0.0	1.0	3.0	1.2	1.0		

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT		
Target>=60		
CO1	51	100%
CO2	51	100%
CO3	51	100%
CO4	51	100%
CO5	51	100%

Targets for SEE			Targets for InA		
ABOVE	60%	3	75%	3	
ABOVE	50%	2	60%	2	
ABOVE	45%	1	45%	1	

COURSE OUTCOMES	CO ATTAINMENT LEVEL IA		SEE		FINAL		INDIRECT		TA	
CO1	100%	3	86%	3	89%	3	85%	3	89%	3
CO2	100%	3	86%	3	89%	3	85%	3	89%	3
CO3	100%	3	86%	3	89%	3	80%	3	88%	3
CO4	100%	3	86%	3	89%	3	82%	3	88%	3
CO5	100%	3	86%	3	89%	3	84%	3	88%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
C17ME82.1	CO1	3.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	3.00	1.00	1.00		
C17ME82.2	CO2	3.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	3.00	1.00	1.00		
C17ME82.3	CO3	3.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	3.00	1.00	1.00		
C17ME82.4	CO4	3.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	3.00	1.00	1.00		
C17ME82.5	CO5	3.00	2.00	2.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	3.00	2.00	1.00		
DIRECT ATTAINMENT		3.00	2.00	2.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	3.00	1.20	1.00		

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
SEMESTER END EXAMINATION	2.59	1.73	1.73	0.00	0.86	0.86	0.00	0.00	0.00	0.86	0.00	0.86	2.59	1.04	0.86		
ASSIGNMENT AND QUIZ\	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
CONTINUOUS INTERNAL EVALUATION	3.00	2.00	2.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	3.00	1.20	1.00		
FINAL DIRECT ATTAINMENT	2.67	1.78	1.78	0.00	0.89	0.89	0.00	0.00	0.00	0.89	0.00	0.89	2.67	1.07	0.89		

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
FINAL DIRECT ATTAINMENT	2.67	1.78	1.78	0.00	0.89	0.89	0.00	0.00	0.00	0.89	0.00	0.89	2.67	1.07	0.89		
PROGRAM EXIT SURVEY	2.49	1.66	1.67	0.00	0.83	0.83	0.00	0.00	0.00	0.83	0.00	0.83	2.49	1.00	0.83		
FINAL ATTAINMENT	2.65	1.77	1.77	0.00	0.88	0.88	0.00	0.00	0.00	0.88	0.00	0.88	2.65	1.06	0.88		

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	MN

BATCH	2020 -2021
SESSION	february 2021 To august 2021
SUBJECT	Additive Manfacturing
SEMESTER	8 B
SUB CODE	17ME82

CLASS STRENGTH	52
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Define Additive manufacturing, understand the different process of Additive Manufacturing and visualize the guidelines provided for AM Process.
CO2	Visualize how a hydraulic/pneumatic and electric actuator will work to accomplish the function.
CO3	Understand the different process of Additive Manufacturing. using Polymer and Powder metallurgy
CO4	Understanding Nano materials and Nano materials manufacturing process. Analyse the different characterization techniques using optical microscopy like SEM, TEM and XRD.
CO5	Describe the various NC, CNC machine programing and Automation techniques

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME82.1	CO1	3	2	0	0	1	1	0	0	0	1	0	1	3	1	1
C17ME82.2	CO2	3	2	0	0	1	1	0	0	0	1	0	1	3	1	1
C17ME82.3	CO3	3	2	0	0	1	1	0	0	0	1	0	1	3	1	1
C17ME82.4	CO4	3	2	0	0	1	1	0	0	0	1	0	1	3	1	1
C17ME82.5	CO5	3	2	2	0	1	1	0	0	0	1	0	1	3	2	1
CO - PO LEVEL		3.0	2.0	2.0	0.0	1.0	1.0	0.0	0.0	0.0	1.0	0.0	1.0	3.0	1.2	1.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	52	100.00%	92%	94%
CO2	52	100.00%	93%	94%
CO3	51	98.08%	93%	94%
CO4	52	100.00%	93%	94%
CO5	52	100.00%	93%	94%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	94%	3	85.2%	3	93%	3
CO2	94%	3	85.2%	3	93%	3
CO3	94%	3	79.7%	3	92%	3
CO4	94%	3	81.9%	3	93%	3
CO5	94%	3	83.7%	3	93%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME82.1	CO1	3.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	3.00	1.00	1.00
C17ME82.2	CO2	3.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	3.00	1.00	1.00
C17ME82.3	CO3	2.94	1.96	0.00	0.00	0.98	0.98	0.00	0.00	0.00	0.98	0.00	0.98	2.94	0.98	0.98
C17ME82.4	CO4	3.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	3.00	1.00	1.00
C17ME82.5	CO5	3.00	2.00	2.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	3.00	2.00	1.00
DIRECT ATTAINMENT		2.99	1.99	2.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	2.99	1.20	1.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.77	1.85	1.85	0.00	0.92	0.92	0.00	0.00	0.00	0.92	0.00	0.92	2.77	1.11	0.92
ASSIGNMENT AND QUIZ	0.60	0.40	0.40	0.00	0.20	0.20	0.00	0.00	0.00	0.20	0.00	0.20	0.60	0.24	0.20
CONTINUOUS INTERNAL EVALUATION	2.39	1.59	1.60	0.00	0.80	0.80	0.00	0.00	0.00	0.80	0.00	0.80	2.39	0.96	0.80
FINAL DIRECT ATTAINMENT	2.82	1.88	1.88	0.00	0.94	0.94	0.00	0.00	0.00	0.94	0.00	0.94	2.82	1.13	0.94

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.82	1.88	1.88	0.00	0.94	0.94	0.00	0.00	0.00	0.94	0.00	0.94	2.82	1.13	0.94
COURSE EXIT SURVEY	2.49	1.66	1.67	0.00	0.83	0.83	0.00	0.00	0.00	0.83	0.00	0.83	2.49	1.00	0.83
FINAL ATTAINMENT	2.79	1.86	1.86	0.00	0.93	0.93	0.00	0.00	0.00	0.93	0.00	0.93	2.79	1.11	0.93
% OF Attainment	92.8	92.8	93.0	0.0	92.8	92.8	0.0	0.0	0.0	92.8	0.0	92.8	92.8	92.9	92.8

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	RG

BATCH	2020 -2021
SESSION	february 2021 To august 2021
SUBJECT	Additive Manfacturing
SEMESTER	8 C
SUB CODE	17ME82

CLASS STRENGTH	60
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Define Additive manufacturing, understand the different process of Additive Understand the different process of Additive Manufacturing. using Polymer and Powder metallurgy
CO2	Manufacturing and visualize the guidelines provided for AM Process.
CO3	Visualize how a hydraulic/pneumatic and electric actuator will work to accomplish the function.
CO4	Understanding Nano materials and Nano materials manufacturing process. Analyse the different characterization techniques using optical microscopy like SEM, TEM and XRD.
CO5	Describe the various NC, CNC machine programing and Automation techniques

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME82.1	CO1	3	2	0	0	1	1	0	0	0	1	0	1	3	1	1
C17ME82.2	CO2	3	2	0	0	1	1	0	0	0	1	0	1	3	1	1
C17ME82.3	CO3	3	2	0	0	1	1	0	0	0	1	0	1	3	1	1
C17ME82.4	CO4	3	2	0	0	1	1	0	0	0	1	0	1	3	1	1
C17ME82.5	CO5	3	2	2	0	1	1	0	0	0	1	0	1	3	2	1
CO - PO LEVEL		3.0	2.0	2.0	0.0	1.0	1.0	0.0	0.0	0.0	1.0	0.0	1.0	3.0	1.2	1.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	6	46.15%	83%	76%
CO2	7	58.33%	83%	78%
CO3	43	100.00%	83%	87%
CO4	16	38.10%	83%	74%
CO5	0	0.00%	83%	67%

COURSE OUTCOMES	ATTAINMENT LEVEL DIRECT		INDIRECT		FINAL	
CO1	76%	3	85.2%	3	77%	3
CO2	78%	3	85.2%	3	79%	3
CO3	87%	3	79.7%	3	86%	3
CO4	74%	2	81.9%	3	75%	3
CO5	67%	2	83.7%	3	68%	2

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME82.1	CO1	1.38	0.92	0.00	0.00	0.46	0.46	0.00	0.00	0.00	0.46	0.00	0.46	1.38	0.46	0.46
C17ME82.2	CO2	1.75	1.17	0.00	0.00	0.58	0.58	0.00	0.00	0.00	0.58	0.00	0.58	1.75	0.58	0.58
C17ME82.3	CO3	3.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	3.00	1.00	1.00
C17ME82.4	CO4	1.14	0.76	0.00	0.00	0.38	0.38	0.00	0.00	0.00	0.38	0.00	0.38	1.14	0.38	0.38
C17ME82.5	CO5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DIRECT ATTAINMENT		1.46	0.97	0.00	0.00	0.49	0.49	0.00	0.00	0.00	0.49	0.00	0.49	1.46	0.49	0.49

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.50	1.67	1.67	0.00	0.83	0.83	0.00	0.00	0.00	0.83	0.00	0.83	2.50	1.00	0.83
ASSIGNMENT AND QUIZ	0.51	0.34	0.34	0.00	0.17	0.17	0.00	0.00	0.00	0.17	0.00	0.17	0.51	0.20	0.17
CONTINUOUS INTERNAL EVALUATION	1.16	0.78	0.00	0.00	0.39	0.39	0.00	0.00	0.00	0.39	0.00	0.39	1.16	0.39	0.39
FINAL DIRECT ATTAINMENT	2.34	1.56	1.40	0.00	0.78	0.78	0.00	0.00	0.00	0.78	0.00	0.78	2.34	0.92	0.78

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.34	1.56	1.40	0.00	0.78	0.78	0.00	0.00	0.00	0.78	0.00	0.78	2.34	0.92	0.78
COURSE EXIT SURVEY	2.49	1.66	1.67	0.00	0.83	0.83	0.00	0.00	0.00	0.83	0.00	0.83	2.49	1.00	0.83
FINAL ATTAINMENT	2.35	1.57	1.43	0.00	0.78	0.78	0.00	0.00	0.00	0.78	0.00	0.78	2.35	0.93	0.78
% OF Attainment	78.4	78.4	0.0	0.0	78.4	78.4	0.0	0.0	0.0	78.4	0.0	78.4	78.4	77.2	78.4

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	LBW

BATCH	2020 -2021
SESSION	April 2021 To July 2021
SUBJECT	PLM
SEMESTER	7A
SUB CODE	17ME83

CLASS STRENGTH	51
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	50
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand the meaning, definitions, scope, need, phases and techniques of operations research. Formulate as L.P.P and derive optimal solutions to linear programming problems by graphical method, Simplex method, Big-M method and Dual Simplex method
CO2	Formulate as Transportation and Assignment problems and derive optimum solutions for transportation, Assignment and travelling salesman problems. Solve problems on game theory for pure and mixed strategy under competitive environment.
CO3	Solve waiting line problems for M/M/1 and M/M/K queuing models.
CO4	Construct network diagrams and determine critical path, floats for deterministic and PERT networks including crashing of Networks
CO5	Determine minimum processing times for sequencing of n jobs-2 machines, n jobs-3 machines, n jobs-m machines and 2 jobs-n machines using Johnson's algorithm

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME83.1	CO1	3	3	2	0	0	1	1	0	0	1	0	1	1	1	0
C17ME83.2	CO2	3	2	2	0	0	1	1	0	0	0	0	1	1	1	0
C17ME83.3	CO3	3	2	0	0	0	0	0	0	0	0	1	1	1	1	0
C17ME83.4	CO4	3	2	2	0	0	2	0	0	0	0	0	1	1	1	0
C17ME83.5	CO5	3	2	2	0	0	1	0	0	0	0	0	1	1	1	0
CO - PO LEVEL		3.0	2.2	2.0	0.0	0.0	1.3	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	51	100.00%	82%	86%
CO2	51	100.00%	82%	86%
CO3	51	100.00%	82%	86%
CO4	50	98.04%	82%	86%
CO5	51	100.00%	82%	86%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	86%	3	80.5%	3	85%	3
CO2	86%	3	77.3%	3	85%	3
CO3	86%	3	74.2%	3	85%	3
CO4	86%	3	74.3%	3	84%	3
CO5	86%	3	78.4%	3	85%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME83.1	CO1	3.00	3.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
C17ME83.2	CO2	3.00	2.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
C17ME83.3	CO3	3.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00
C17ME83.4	CO4	2.94	1.96	1.96	0.00	0.00	1.96	0.00	0.00	0.00	0.00	0.00	0.98	0.98	0.98	0.00
C17ME83.5	CO5	3.00	2.00	2.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
DIRECT ATTAINMENT		2.99	2.19	1.99	0.00	0.00	1.24	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.47	1.81	1.65	0.00	0.00	1.03	0.82	0.00	0.00	0.82	0.82	0.82	0.82	0.82	0.00
ASSIGNMENT AND QUIZ	0.59	0.43	0.39	0.00	0.00	0.25	0.20	0.00	0.00	0.20	0.20	0.20	0.20	0.20	0.00
CONTINUOUS INTERNAL EVALUATION	2.39	1.75	1.59	0.00	0.00	0.99	0.80	0.00	0.00	0.80	0.80	0.80	0.80	0.80	0.00
FINAL DIRECT ATTAINMENT	2.57	1.89	1.72	0.00	0.00	1.07	0.86	0.00	0.00	0.86	0.86	0.86	0.86	0.86	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.57	1.89	1.72	0.00	0.00	1.07	0.86	0.00	0.00	0.86	0.86	0.86	0.86	0.86	0.00
COURSE EXIT SURVEY	2.31	1.70	1.55	0.00	0.00	0.96	0.79	0.00	0.00	0.80	0.74	0.77	0.77	0.77	0.00
FINAL ATTAINMENT	2.55	1.87	1.70	0.00	0.00	1.06	0.85	0.00	0.00	0.85	0.85	0.85	0.85	0.85	0.00
% OF Attainment	84.9	85.0	85.0	0.0	0.0	84.9	85.2	0.0	0.0	85.3	84.7	84.9	84.9	84.9	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	LBW

BATCH	2020 -2021
SESSION	April 2021 To July 2021
SUBJECT	PLM
SEMESTER	7B
SUB CODE	17ME83

CLASS STRENGTH	52
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	40
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
80%	20%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Understand the meaning, definitions, scope, need, phases and techniques of operations research. Formulate as L.P.P and derive optimal solutions to linear programming problems by graphical method, Simplex method, Big-M method and Dual Simplex method
CO2	Formulate as Transportation and Assignment problems and derive optimum solutions for transportation, Assignment and travelling salesman problems. Solve problems on game theory for pure and mixed strategy under competitive environment.
CO3	Solve waiting line problems for M/M/1 and M/M/K queuing models.
CO4	Construct network diagrams and determine critical path, floats for deterministic and PERT networks including crashing of Networks
CO5	Determine minimum processing times for sequencing of n jobs-2 machines, n jobs-3 machines, n jobs-m machines and 2 jobs-n machines using Johnson's algorithm

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME83.1	CO1	3	3	2	0	0	1	1	0	0	1	0	1	1	1	0
C17ME83.2	CO2	3	2	2	0	0	1	1	0	0	0	0	1	1	1	0
C17ME83.3	CO3	3	2	0	0	0	0	0	0	0	0	1	1	1	1	0
C17ME83.4	CO4	3	2	2	0	0	2	0	0	0	0	0	1	1	1	0
C17ME83.5	CO5	3	2	2	0	0	1	0	0	0	0	0	1	1	1	0
CO - PO LEVEL		3.0	2.2	2.0	0.0	0.0	1.3	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			S E E	Final Direct C O % Attainment
Target>=60				
CO1	51	100.00%	93%	94%
CO2	51	100.00%	93%	94%
CO3	51	100.00%	93%	94%
CO4	50	98.04%	93%	94%
CO5	51	100.00%	93%	94%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	94%	3	80.5%	3	93%	3
CO2	94%	3	77.3%	3	93%	3
CO3	94%	3	74.2%	3	92%	3
CO4	94%	3	74.3%	3	92%	3
CO5	94%	3	78.4%	3	93%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME83.1	CO1	3.00	3.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
C17ME83.2	CO2	3.00	2.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
C17ME83.3	CO3	3.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00
C17ME83.4	CO4	2.94	1.96	1.96	0.00	0.00	1.96	0.00	0.00	0.00	0.00	0.00	0.98	0.98	0.98	0.00
C17ME83.5	CO5	3.00	2.00	2.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
DIRECT ATTAINMENT		2.99	2.19	1.99	0.00	0.00	1.24	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.79	2.04	1.86	0.00	0.00	1.16	0.93	0.00	0.00	0.93	0.93	0.93	0.93	0.93	0.00
ASSIGNMENT AND QUIZ	0.58	0.42	0.38	0.00	0.00	0.24	0.19	0.00	0.00	0.19	0.19	0.19	0.19	0.19	0.00
CONTINUOUS INTERNAL EVALUATION	2.39	1.75	1.59	0.00	0.00	0.99	0.80	0.00	0.00	0.80	0.80	0.80	0.80	0.80	0.00
FINAL DIRECT ATTAINMENT	2.82	2.07	1.88	0.00	0.00	1.18	0.94	0.00	0.00	0.94	0.94	0.94	0.94	0.94	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.82	2.07	1.88	0.00	0.00	1.18	0.94	0.00	0.00	0.94	0.94	0.94	0.94	0.94	0.00
COURSE EXIT SURVEY	2.31	1.70	1.55	0.00	0.00	0.96	0.79	0.00	0.00	0.80	0.74	0.77	0.77	0.77	0.00
FINAL ATTAINMENT	2.77	2.03	1.85	0.00	0.00	1.15	0.93	0.00	0.00	0.93	0.92	0.92	0.92	0.92	0.00
% OF Attainment	92.4	92.4	92.4	0.0	0.0	92.3	92.6	0.0	0.0	92.8	92.2	92.4	92.4	92.4	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	#REF!

BATCH	2020-2021
SESSION	FEB 2020 TO JUNE 2021
SUBJECT	PRODUCT LIFE CYCLE MANAGEMENT
SEMESTER	8C
SUB CODE	17ME835

CLASS STRENGTH	51
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	40
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
75%	25%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Explain the various strategies of PLM and product data management
CO2	Describe decomposition of product design and model simulation
CO3	apply the concept of new product Devolopment and its structuring
CO4	Analyze the technological forecasting and the tools in the innovation
CO5	Apply the vertual product devolopment and model analysis

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME835.1	CO1	3	3	2	0	0	1	1	0	0	1	0	1	1	1	0
C17ME835.2	CO2	3	2	2	0	0	1	1	0	0	0	0	1	1	1	0
C17ME835.3	CO3	3	2	0	0	0	0	0	0	0	0	1	1	1	1	0
C17ME835.4	CO4	3	2	2	0	0	2	0	0	0	0	0	1	1	1	0
C17ME835.5	CO5	3	2	2	0	0	1	0	0	0	0	0	1	1	1	0
CO - PO LEVEL		3.0	2.2	2.0	0.0	0.0	1.3	1.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT			SEE	Final Direct CO % Attainment
Target>=60				
CO1	51	100.00%	98%	99%
CO2	51	100.00%	98%	99%
CO3	51	100.00%	98%	99%
CO4	51	100.00%	98%	99%
CO5	51	100.00%	98%	99%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	99%	3	86.2%	3	97%	3
CO2	99%	3	76.3%	3	96%	3
CO3	99%	3	76.3%	3	96%	3
CO4	99%	3	74.8%	3	96%	3
CO5	99%	3	79.3%	3	97%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME835.1	CO1	3.00	3.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
C17ME835.2	CO2	3.00	2.00	2.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
C17ME835.3	CO3	3.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00
C17ME835.4	CO4	3.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
C17ME835.5	CO5	3.00	2.00	2.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
DIRECT ATTAINMENT		3.00	2.20	2.00	0.00	0.00	1.25	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.95	2.16	1.97	0.00	0.00	1.23	0.98	0.00	0.00	0.98	0.98	0.98	0.98	0.98	0.00
ASSIGNMENT AND QUIZ	0.72	0.53	0.48	0.00	0.00	0.30	0.24	0.00	0.00	0.24	0.24	0.24	0.24	0.24	0.00
CONTINUOUS INTERNAL EVALUATION	2.25	1.65	1.50	0.00	0.00	0.94	0.75	0.00	0.00	0.75	0.75	0.75	0.75	0.75	0.00
FINAL DIRECT ATTAINMENT	2.95	2.17	1.97	0.00	0.00	1.23	0.98	0.00	0.00	0.98	0.98	0.98	0.98	0.98	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.95	2.17	1.97	0.00	0.00	1.23	0.98	0.00	0.00	0.98	0.98	0.98	0.98	0.98	0.00
COURSE EXIT SURVEY	2.36	1.74	1.58	0.00	0.00	0.98	0.81	0.00	0.00	0.86	0.76	0.79	0.79	0.79	0.00
FINAL ATTAINMENT	2.89	2.12	1.93	0.00	0.00	1.21	0.97	0.00	0.00	0.97	0.96	0.96	0.96	0.96	0.00
% OF Attainment	96.4	96.5	96.5	0.0	0.0	96.4	96.7	0.0	0.0	97.2	96.2	96.4	96.4	96.4	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	ANR

BATCH	2019 AUG-APRIL 2020
SESSION	february 2021 To august 2021
SUBJECT	Internship Practise
SEMESTER	8
SUB CODE	15ME84

CLASS STRENGTH	153
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	40
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
100%	0%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	ABLE TO LEARN INDUSTRIAL PRACTICES
CO2	LEARN TO WORK IN TEAMS
CO3	LEARN TO READ ASSEMBLY DRAWINGS AND WORK ON DIFFERENT MACHINES
CO4	KNOW THE SAFETY MEASURES IN INDUSTRIES
CO5	KNOW INDUSTRIAL ACTS AND AWARENESS ABOUT POLLUTION

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C15ME84.1	CO1	1	1	0	0	1	0	0	0	2	1	1	2	0	0	0
C15ME84.2	CO2	1	1	0	0	1	0	2	0	2	1	0	2	0	0	0
C15ME84.3	CO3	1	1	0	0	1	0	0	1	3	3	2	2	0	0	0
C15ME84.4	CO4	0	0	0	0	2	0	0	0	3	2	1	2	0	0	0
C15ME84.5	CO5	0	0	0	0	2	0	0	0	3	2	1	2	0	0	0
CO - PO LEVEL		1.0	1.0	0.0	0.0	1.4	0.0	2.0	1.0	2.6	1.8	1.3	2.0	0.0	0.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	153	100.00%	100%	100%
CO2	153	100.00%	100%	100%
CO3	153	100.00%	100%	100%
CO4	153	100.00%	100%	100%
CO5	153	100.00%	100%	100%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	100%	3	80.5%	3	98%	3
CO2	100%	3	77.3%	3	98%	3
CO3	100%	3	74.2%	3	97%	3
CO4	100%	3	74.3%	3	97%	3
CO5	100%	3	78.4%	3	98%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C15ME84.1	CO1	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	2.00	1.00	1.00	2.00	0.00	0.00	0.00
C15ME84.2	CO2	1.00	1.00	0.00	0.00	1.00	0.00	2.00	0.00	2.00	1.00	0.00	2.00	0.00	0.00	0.00
C15ME84.3	CO3	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	3.00	3.00	2.00	2.00	0.00	0.00	0.00
C15ME84.4	CO4	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	3.00	2.00	1.00	2.00	0.00	0.00	0.00
C15ME84.5	CO5	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	3.00	2.00	1.00	2.00	0.00	0.00	0.00
DIRECT ATTAINMENT		1.00	1.00	0.00	0.00	1.40	0.00	2.00	1.00	2.60	1.80	1.25	2.00	0.00	0.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	1.00	1.00	0.00	0.00	1.40	0.00	2.00	1.00	2.60	1.80	1.25	2.00	0.00	0.00	0.00
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	1.00	1.00	0.00	0.00	1.40	0.00	2.00	1.00	2.60	1.80	1.25	2.00	0.00	0.00	0.00
FINAL DIRECT ATTAINMENT	1.00	1.00	0.00	0.00	1.40	0.00	2.00	1.00	2.60	1.80	1.25	2.00	0.00	0.00	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	1.00	1.00	0.00	0.00	1.40	0.00	2.00	1.00	2.60	1.80	1.25	2.00	0.00	0.00	0.00
COURSE EXIT SURVEY	0.47	0.47	0.00	0.00	0.66	0.00	0.94	0.47	1.22	0.85	0.59	0.94	0.00	0.00	0.00
FINAL ATTAINMENT	0.95	0.95	0.00	0.00	1.33	0.00	1.89	0.95	2.46	1.70	1.18	1.89	0.00	0.00	0.00
% OF Attainment	94.7	94.7	0.0	0.0	94.7	0.0	94.7	94.7	94.7	94.7	94.7	94.7	0.0	0.0	0.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	0

BATCH	2020 -2021
SESSION	february 2021 To august 2021
SUBJECT	PROJECT PAHSE II
SEMESTER	8
SUB CODE	17ME85

CLASS STRENGTH	154
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	40
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
100%	0%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Identify and interpret the realistic mechanical engineering problems and related systems.
CO2	Apply the basic principles and concepts of mechanical engineering in real world systems based on professional ethics and responsibilities
CO3	Criticize and experiment to achieve optimum solutions for mechanical engineering problems.
CO4	Analyse, evaluate and review the obtained solution for problems in mechanical engineering systems.
CO5	Able to use the tools and learn fabrication, design and work in teams

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME85.1	CO1	3	0	0	2	0	1	2	0	2	2	0	3	1	1	1
C17ME85.2	CO2	3	2	2	0	0	0	0	3	3	3	2	3	0	0	0
C17ME85.3	CO3	0	0	2	0	0	0	0	0	3	2	2	3	0	0	0
C17ME85.4	CO4	0	3	2	2	2	0	0	0	2	3	3	3	3	1	3
C17ME85.5	CO5	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
CO - PO LEVEL		3.0	2.5	2.0	2.0	2.0	1.0	2.0	3.0	2.5	2.5	2.3	3.0	2.0	1.0	2.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct C O % Attainment
CO1	153	100.00%	99%	99%
CO2	153	100.00%	99%	99%
CO3	153	100.00%	99%	99%
CO4	153	100.00%	99%	99%
CO5	153	100.00%	99%	99%

COURSE OUTCOMES	ATTAINMENT LEVEL DIRECT		INDIRECT		FINAL	
CO1	99%	3	83.8%	3	98%	3
CO2	99%	3	85.2%	3	98%	3
CO3	99%	3	87.2%	3	98%	3
CO4	99%	3	85.4%	3	98%	3
CO5	99%	3	85.6%	3	98%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C17ME85.1	CO1	3.00	0.00	0.00	2.00	0.00	1.00	2.00	0.00	2.00	2.00	0.00	3.00	1.00	1.00	1.00
C17ME85.2	CO2	3.00	2.00	2.00	0.00	0.00	0.00	0.00	3.00	3.00	3.00	2.00	3.00	0.00	0.00	0.00
C17ME85.3	CO3	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	3.00	2.00	2.00	3.00	0.00	0.00	0.00
C17ME85.4	CO4	0.00	3.00	2.00	2.00	2.00	0.00	0.00	0.00	2.00	3.00	3.00	3.00	3.00	1.00	3.00
C17ME85.5	CO5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00	0.00	0.00
DIRECT ATTAINMENT		3.00	2.50	2.00	2.00	2.00	1.00	2.00	3.00	2.50	2.50	2.33	3.00	2.00	1.00	2.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.98	2.48	1.99	1.99	1.99	0.99	1.99	2.98	2.48	2.48	2.32	2.98	1.99	0.99	1.99
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	3.00	2.50	2.00	2.00	2.00	1.00	2.00	3.00	2.50	2.50	2.33	3.00	2.00	1.00	2.00
FINAL DIRECT ATTAINMENT	2.98	2.49	1.99	1.99	1.99	0.99	1.99	2.98	2.49	2.49	2.32	2.98	1.99	0.99	1.99

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.98	2.49	1.99	1.99	1.99	0.99	1.99	2.98	2.49	2.49	2.32	2.98	1.99	0.99	1.99
COURSE EXIT SURVEY	2.54	2.13	1.72	1.69	1.71	0.84	1.68	2.56	2.14	2.13	2.00	2.56	1.70	0.85	1.70
FINAL ATTAINMENT	2.94	2.45	1.96	1.96	1.96	0.98	1.96	2.94	2.45	2.45	2.29	2.94	1.96	0.98	1.96
% OF Attainment	98.0	98.1	98.1	98.0	98.1	97.9	97.9	98.1	98.1	98.1	98.1	98.1	98.0	98.0	98.0

RNS INSTITUTE OF TECHNOLOGY

(AICTE Approved and VTU Affiliated)

CHANNASANDRA, Dr. VISHNUVARDHANA ROAD, BENGALURU - 560 098, KARNATAKA, INDIA

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty Name	0

BATCH	2019-2020
SESSION	february 2021 To august 2021
SUBJECT	SEMINAR
SEMESTER	8
SUB CODE	15MES86

CLASS STRENGTH	154
SET TARGET FOR INTERNAL ASSESSMENT (%)	60
SET TARGET FOR UNIVERSITY EXAMINATION (%)	40
WEIGHTAGE FOR CONTINUOUS INTERNAL EVALUATION	20%
WEIGHTAGE FOR SEMESTER END EXAMINATION	80%

Internal Marks Weightage		DIRECT	INDIRECT
Tests IA	Quiz + Assign		
100%	0%		
FINAL ATTAINMENT		90%	10%

Course Outcomes

CO1	Demonstrate the ability to engage in self learning
CO2	Review scientific literature and interpret the results presented
CO3	Organize and present technical content in a structured manner
CO4	Utilize modern tools (audio/visual aids) for effective presentation of scientific content
CO5	Demonstrate the principles of professional ethics

Total Outcome

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C15MES86.1	CO1	3	3	0	3	0	0	0	0	0	0	0	3	3	3	0
C15MES86.2	CO2	3	3	0	3	0	0	0	0	0	0	0	3	3	0	0
C15MES86.3	CO3	3	3	0	0	0	0	0	0	0	3	0	3	3	0	0
C15MES86.4	CO4	3	3	0	3	3	0	0	0	3	3	0	3	3	0	0
C15MES86.5	CO5	0	0	0	0	0	0	0	3	0	0	0	3	0	3	0
CO - PO LEVEL		3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0	3.0	0.0	3.0	3.0	3.0	0.0

TARGET				LEVEL
75.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	3
60.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	2
45.00%	STUDENTS MUST SCORE	60.00	% & ABOVE	1

PO AND CO SCALE		
	3	Substantially related
	2	Moderately related
	1	Slightly related

INTERNAL ASSESSMENT Target>=60			SEE	Final Direct CO % Attainment
CO1	153	100%	99%	99%
CO2	153	100%	99%	99%
CO3	153	100%	99%	99%
CO4	153	100%	99%	99%
CO5	153	100%	99%	99%

COURSE OUTCOMES	ATTAINMENT LEVEL					
	DIRECT		INDIRECT		FINAL	
CO1	99%	3	82.1%	3	98%	3
CO2	99%	3	82.7%	3	98%	3
CO3	99%	3	82.7%	3	98%	3
CO4	99%	3	84.3%	3	98%	3
CO5	99%	3	84.1%	3	98%	3

Direct Attainment of PO from Internal Assessment

COURSE OUTCOMES		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C15MES86.1	CO1	3.00	3.00	0.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	3.00	3.00	0.00
C15MES86.2	CO2	3.00	3.00	0.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	3.00	0.00	0.00
C15MES86.3	CO3	3.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00	3.00	3.00	0.00	0.00
C15MES86.4	CO4	3.00	3.00	0.00	3.00	3.00	0.00	0.00	0.00	3.00	3.00	0.00	3.00	3.00	0.00	0.00
C15MES86.5	CO5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00	0.00	0.00	3.00	0.00	3.00	0.00
DIRECT ATTAINMENT		3.00	3.00	0.00	3.00	3.00	0.00	0.00	3.00	3.00	3.00	0.00	3.00	3.00	3.00	0.00

INTERMEDIATE DIRECT ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
SEMESTER END EXAMINATION	2.98	2.98	0.00	2.98	2.98	0.00	0.00	2.98	2.98	2.98	0.00	2.98	2.98	2.98	0.00
ASSIGNMENT AND QUIZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CONTINUOUS INTERNAL EVALUATION	3.00	3.00	0.00	3.00	3.00	0.00	0.00	3.00	3.00	3.00	0.00	3.00	3.00	3.00	0.00
FINAL DIRECT ATTAINMENT	2.98	2.98	0.00	2.98	2.98	0.00	0.00	2.98	2.98	2.98	0.00	2.98	2.98	2.98	0.00

FINAL ATTAINMENT LEVEL OF PROGRAM OUTCOMES

All COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
FINAL DIRECT ATTAINMENT	2.98	2.98	0.00	2.98	2.98	0.00	0.00	2.98	2.98	2.98	0.00	2.98	2.98	2.98	0.00
COURSE EXIT SURVEY	2.49	2.49	0.00	2.49	2.53	0.00	0.00	2.52	2.53	2.51	0.00	2.50	2.49	2.49	0.00
FINAL ATTAINMENT	2.93	2.93	0.00	2.94	2.94	0.00	0.00	2.94	2.94	2.94	0.00	2.94	2.93	2.94	0.00
% OF Attainment	97.8	97.8	0.0	97.8	98.0	0.0	0.0	97.9	98.0	97.9	0.0	97.9	97.8	97.8	0.0