

## LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC with B++ Grade, ISO 9001:2015 Certified Institution Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

## **R20 REGULATION- ALL FIRST YEAR COURSES**

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
ming	CO1	Understand the syntax and semantics of programming language constructs.	2	3	1	-	-	-	-	-	-	-	-	-
Program	CO2	Understand the text processing using strings and arrays.	2	3	-	-	-	-	-	-	-	-	-	-
[ational	CO3	Apply user defined functions to solve a given problem.	2	3	2	-	ı	-	ı	ı	ı	-	-	-
20AD01 Computational Programming	CO4	Analyze the storage representation using the derived data types such as structures and unions.	2	3	2	-	-	-	-	-	-	-	-	-
20AD	CO5	Create permanent storage to data processed in a program using files.	2	3	2	-	ı	-	ı	ı	ı	-	-	-
Computational amming Lab	CO1	Apply control structures of C in solving computational problems.	2	3	1	-	-	-	-	-	1	1	-	2
AD51 Computatior Programming Lab	CO2	Implement functions and use modular programming in problem solving.	2	3	1	-	-	_	-	-	1	1	-	2
20AD51 Progra	CO3	Create user defined datatypes and perform file operations.	2	3	1	-	-	-	-	-	1	1	-	2

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
20AE01 Elements of Aerospace Engineering	CO1	Describe functions of various external and internal components of an airplane.	3	3	1	2	ı	ı	2	ı	-	1	2	3
lements of A Engineering	CO2	Classify the various forces and moments acting on an airfoil	3	3	1	2	ı	ı	2	ı	-	1	2	3
E01 Elen En	CO3	Describe the working principles of various aircraft engine systems.	3	3	1	2	-	-	2	-	-	1	2	3
20AJ	CO4	Describe the basic aspects of space flight	3	3	1	2	2	ı	2	ı	-	1	2	3
20CE01 Surveying	CO1	Understand the basic principles involved in linear and angular measurements, functioning of total station, levelling measurements and characteristic properties of simple curve	1	1	2	2	-	3	2	2	1	2	3	-
20CE01 S	CO2	Develop the longitudinal, lateral and contour profiles of a given area using fundamental principles of levelling.	2	-	2	-	2	-	-	-	-	2	-	-
	CO3	Calculate the area and volume of required boundaries.	1	1	-	2	-	-	2	2	1	2	-	-

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
	CO4	Determine the distance and elevations of an object using tacheometer and EDM principles.	-	1	2	-	2	-	-	-	1	-	-	-
uction	CO1	Understand the preparation process and the composition of construction materials such as Stones, bricks and timber.	3	-	-	-	-	-	-	-	-	-	-	2
20CE02 Building Materials and Construction	CO2	Describe the sources, constituents and storage of lime and cement for their appropriate usage as building materials based on their specific attributes.	3	-	-	-	-	-	-	-	-	-	-	1
llding Mate	CO3	Identify the different components in a building and their specific purpose in the building.	3	-	-	-	-	-	-	-	-	-	-	2
OCE02 Bui	CO4	Classify the various types of mortars, masonry components and finishings used in the buildings.	3	-	-	-	-	-	-	-	-	-	-	1
.4	CO5	Identify the uses, good and faulty characteristics of different building materials.	2	2	-	1	-	-	-	-	-	-	-	2

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
20CE04 Basic Civil and Mechanical Engineering	CO1	Compute the center of gravity and Centroid in simple basic structures and resolve the system of forces from free body diagrams while designing any component.	3	1	1	1	-	-	-	-	-	-	-	1
<b>[echanic</b>	CO2	Differentiates the fluid statics and kinematic principles in fluid flows.	2	2	-	1	-	-	-	-	-	-	-	1
il and M	CO3	Understand the working principles of hydraulic turbines.	3	3	1	1	ı	-	-	1	-	-	-	-
E04 Basic Civ	CO4	Understand the laws of thermodynamics and working principles in Internal Combustion engines.	2	2	1	1	1	-	-	1	-	-	-	1
20C	CO5	Comprehends the working principles of steam and gas turbines	3	2	1	-	-	-	-	-	-	-	-	2
Applied inics	CO1	Determine the resultant force and moment for a given system of forces.	3	-	-	-	-	-	-	-	-	-	-	1
20CE03 Applied Mechanics	CO2	Calculate the unknown forces in members of planar systems by constructing free body	3	-	-	-	-	-	-	-	-	-	-	1

Course	CO		PO	PO1	PO1	PO1								
Name	No.	<b>Course Outcomes</b>	1	2	3	4	5	6	7	8	9	0	1	2
		diagrams and applying static equilibrium conditions.												
	CO3	Examine the motion/ impeding the motion of bodies on horizontal/inclined planes associated with frictional forces.	3	-	-	-	-	-	-	-	-	-	-	1
	CO4	Analyze for the internal forces in the members of a pin jointed perfect frames subjected to horizontal, vertical and inclined loads.	3	-	-	-	-	-	-	-	-	-	-	1
	CO5	Determine the centroid and second moment of area of simple and composite areas.	3	-	-	-	-	-	-	-	-	-	-	1
20CE51 Surveying Lab	CO1	Compute linear and angular measurements in the field using chain and compass	2	1	1	1							2	
E51 Sur Lab	CO2	Plot a given area using plane table in the field.	2	2	2	3							2	
20C	CO3	determine the elevations of different points on the	2	2	1	2							2	

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
		ground using principles of leveling												
Bu	CO1	Draw simple objects based on principles of geometry.	2	2	-	1	-	-	-	1	-	-	-	-
CE52 Civil Engineering Drafting Techniques	CO2	Sketch the projections of an object based on the angles of projection.	2	2	-	1	-	-	-	-	-	-	-	-
ivil Eı g Tecl	CO3	Draft simple objects using ArchiCAD	2	2	2	2	-	_	-	1	1	-	-	-
20CE52 C Draftin	CO4	Develop, draw and edit simple objects related to civil engineering applications using ArchiCAD.	2	2	2	2	1	-	1	I	1	-	-	-
nanical	CO1	Find the Viscosity of different oils using Viscometers.	3	1	1	3	-	-	-	-	2	-	-	-
nd Mech g Lab	CO2	Analyze valve and port timing diagrams in I.C engines	2	2	-	3	-	-	-	-	2	-	-	1
20CE53 Basic Civil and Mechanical Engineering Lab	CO3	Determine the performance parameters of hydraulic turbines.	3	3	1	3	-	-	-	-	2	-	-	-
E53 Basi En	CO4	Conduct the Reynolds experiment to decide the flow classification	2	2	1	3	-	_	-	-	2	-	-	1
20C]	CO5	Evaluate Bernoulli's principles in pipe flows.	3	2	-	3	-	_	-	-	2	-	-	2

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
Solving	CO1	Familiar with syntax and semantics of the basic programming language constructs.	2	3	-	-	-	-	ı	ı	-	1	-	1
Problem	CO2	Construct derived data types like arrays in solving problem.	2	3	2	1	-	-	-	-	-	1	-	1
Programming for Problem Solving using C	CO3	Decompose a problem into modules and reconstruct it using various ways of user-defined functions.	2	3	2	1	-	-	-	-	-	1	-	1
01 Progra	CO4	Define user-defined data types like structures and unions and its applications to solve problems.	2	3	2	-	-	-	-	-	-	1	-	1
20CS01	CO5	Discuss various file I/O operations and its application.	2	3	2	_	-	-	1	-	-	1	-	1
20CS02 Digital Logic Design	CO1	Explain the digital number systems, Boolean algebra theorems, properties, and canonical forms for digital logic circuit design.	3	3	1	-	-	-	-	-	-	-	-	1
20CS02 I D	CO2	Apply Boolean algebra concepts and K-Maps for minimization of Boolean expressions.	3	3	3	1	-	-	-	-	-	-	-	-

Course	CO		PO	PO1	PO1	PO1								
Name	No.	<b>Course Outcomes</b>	1	2	3	4	5	6	7	8	9	0	1	2
	CO3	Construct the combinational circuits using Adders, Sub tractors, Decoders, Multiplexers and Magnitude Comparators.	3	3	3	1	-	-	-	-	-	-	-	-
	CO4	Demonstrate the sequential circuits using Flip-flops, Shift registers, and Counters & Memory unit.	3	3	3	1	-	-	-	-	-	-	-	-
	CO5	Construct programmable logic devices (PROM, PAL, and PLA).	2	3	3	1	-	-	-	-	-	-	-	-
ructures	CO1	Write the algorithms for various operations on list using arrays and linked list and analyze the time complexity of its operations.	3	2	-	-	-	-	-	-	-	-	-	-
20CS03 Data Structures	CO2	Apply linear data structures like stack and queue in problem solving.	3	1	-	-	-	-	-	-	-	-	-	-
20CS03	CO3	Demonstrate various searching and sorting techniques and compare their computational complexities in terms of space and time.	3	1	-	-	-	-	-	-	-	-	-	-

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
	CO4	Write the algorithms for various operations on binary trees, binary search trees and AVL trees.	3	1	-	-	-	-	-	-	-	-	-	-
	CO5	Demonstrate graph traversal techniques and hashing techniques.	3	1	-	-	-	-	-	-	-	-	-	-
res	CO1	Construct mathematical arguments using logical connectives & quantifiers and verify them.	3	3	-	-	-	-	-	-	-	-	-	-
ical Structu	CO2	Demonstrate the basic terminology of functions, relations, lattices, and their operations.	3	3	1	2	1	-	-	1	-	-	-	-
Mathemati	CO3	Apply the properties of graphs to solve the graph theory problems in Computer science.	3	3	1	2	-	-	-	-	-	-	-	-
20CS04 Discrete Mathematical Structures	CO4	Illustrate the basic principles/techniques to solve different algebraic structures & combinatorial problems.	3	3	2	1	-	-	-	-	-	-	-	-
20C	CO5	Solve linear recurrence relations by recognizing homogeneity using constant coefficients	3	3	1	-	-	-	-	-	-	-	-	-

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
		characteristic roots and Generating functions.												
	CO1	Identify basic building blocks of python to solve mathematical problems.	3		2	-	-	-	-	-	-	-	-	-
Python Prograaming	CO2	Apply the in-built data structures like list, tuple, set and dictionary for solving problems.	-	3	2	-	1	-	-	-	-	-	-	-
hon Prog	CO3	Use exception-handling mechanism to catch runtime errors.	-	3	2	-	2	-	-	-	-	-	-	-
20CS05 Pyt	CO4	Demonstrate compelling concepts about string manipulation, regular expressions, and file handling.	-	3	2	-	2	-	-	-	-	-	-	-
	CO5	Demonstrate object- oriented programming principles of python.	-	3	2	-	2	-	-	-	-	-	-	-
20CS51 Programming for Problem	CO1	Apply control structures of C in solving computational problems.	2	3	1	-	-	-	-	-	1	1		2
200 Progra	CO2	Implement derived data types & use modular	2	3	1	-	-	-	-	-	1	1		2

Course	CO		PO	PO1	PO1	PO1								
Name	No.	<b>Course Outcomes</b>	1	2	3	4	5	6	7	8	9	0	1	2
		programming in problem solving.												
	CO3	Implement user defined data types and perform file operations.	2	3	1	-	-	-	-	-	1	1		2
	CO4	Improve individual / teamwork skills, communication & report writing skills with ethical values.	2	3	1	-	-	-	-	-	1	1		2
Lab	CO1	Implement basic logic gates and special logic gates using NAND and NOR gates.	2	1	3	1	3	1	-	-	-	-	-	-
20CS52 Digital Logic Design Lab	CO2	Design combinational circuits like half-adders, full-adders, decoders, encoders, multiplexers.	1	2	3	1	3	1	-	-	-	-	-	-
2 Digital Lo	CO3	Design sequential digital circuits like flip-flops, Shift registers, and Counters.	1	2	3	1	3	-	-	1	-	-	-	ı
20CS5;	CO4	Improve individual / teamwork skills, communication & report writing skills with ethical values.	-	-	-	-	-	-	-	2	2	2	-	-

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
Lab	CO1	Implement Linear Data Structures using array and Linked list.	-	2	1	-	1	-	-	-	-	-	-	-
ctures	CO2	Implement Various Sorting Techniques.	-	2	1	-	1	-	1	1	-	-	-	-
Data Structures Lab	CO3	Implement Non-Linear Data Structure such as Trees &Graphs.	-	2	1	-	1	-	-	-	-	-	-	-
20CS53 D	CO4	Improve individual / teamwork skills, communication & report writing skills with ethical values.	-	-	-	-	-	-	-	2	2	2	-	-
Lab	CO1	Apply building blocks of Python in solving computational problems.	3	-	-	2	1	-	-	-	-	-	-	-
ogramming	CO2	Implement in-built data structures available in Python to solve computational problems.	-	3	2	3	2	-	-	-	-	-	-	-
20CS54 Python Programming Lab	CO3	Implement modular programming, string manipulations and Object-oriented programming in python.	-	3	2	3	2	-	-	-	-	-	-	-
20CS	CO4	Improve individual / teamwork skills, communication & report	-	-	_	-	-	_	-	2	2	2	-	-

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
		writing skills with ethical values.												
gu	CO1	Understand the basic unix/linux commands.	3	2	2	1	-	-	-	ı	-	-	-	2
Shell Scripting	CO2	Learn importance of shell scripting.	3	2	3	1	-	-	-	-	-	-	-	2
hell S	CO3	Apply shell programming to various files.	3	2	3	1	-	-	-	-	-	-	-	2
20CS55 S	CO4	Improve individual / teamwork skills, communication & report writing skills with ethical values.	-	-	-	-	-	-	-	2	2	2	-	-
20EC01 Electronic Devices & Circuits	CO1	Identify the types of Diodes, Transistors, FETs, Biasing techniques and their comparisons to select the best approaches for designing the electronic circuits using Devices and components.	2	3	1	-	-	3	1	ı	-	-	1	2
20EC01 Ele	CO2	Interpret the mathematical models of Currents & Voltages of Diodes, Bipolar Junction Transistors and Field Effect Transistors and	2	1	2	1	-	3	1	-	-	-	-	1

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
		biasing of BJT and FET using fundamental circuits.												
	CO3	Apply the knowledge of diodes, transistors and filters for designing the rectifiers, Filters, Regulators and Amplifier circuits using Devices and components.	3	1	1	-	-	-	1	-	-	-	-	-
	CO4	Analyze the characteristics of Diodes, Bipolar Junction Transistors, Field Effect Transistors and their equivalent models using Characteristics and mathematical models.	1	3	-	-	-	-	-	-	-	-	1	1
20EC02 Digital Logic Circuits	CO1	Summarize the key differences between number systems and their usage in Digital electronics circuits.	2	3	1	-	-	3	1	ı	-	-	1	2
20EC02 I Ci	CO2	Identify the minimization techniques of Boolean expressions to implement digital circuits using basic	2	1	2	1	-	3	1	-	-	-	-	1

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
		logic gates and logic circuits.												
	CO3	Apply the minimization and realization methods for design of Combinational and Sequential logic circuits.	3	1	1	-	-	-	1	-	-	-	-	-
	CO4	Analyze the Combinational, Sequential, Finite state machines and Algorithmic State Machines for implementation of digital logic circuits.	1	3	-	-	-	-	-	-	-	-	1	1
c Devices &	CO1	Demonstrate the characteristics of Diodes, BJT, FET, Voltage regulators, Diode applications.	2	1	-	-	-	-	-	-	-	-	-	-
20EC51 Electronic Devices & Circuits Lab	CO2	Analyze the device parameters of Diodes, Bipolar Junction Transistors, and Field Effect Transistors for its electrical parameters using VI characteristics.	3	1	1	-	-	-	-	-	-	-	-	-

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
	CO3	Apply the knowledge of diodes, Capacitors and transistors for the realization of rectifiers, regulators, Clippers and Clampers circuits.	3	1	1	-	-	-	-	-	1	-	1	1
	CO4	Adapt effective Communication, presentation and report writing skills	-	-	-	-	-	-	-	-	3	2	-	-
ts Lab	CO1	Demonstrate the functionality of Logic gates, Flip-flops, Shift registers and Counters.	2	2	1	2	2	-	-	-	-	-	-	2
20EC52 Digital Logic Circuits Lab Lab	CO2	Apply the Boolean minimization methods to implement Combinational and Sequential logic circuits using logic gates.	2	3	2	3	3	-	-	-	1	-	-	2
2 Digita	CO3	Analyze the behavior of Combinational and Sequential logic circuits.	2	3	2	2	3	-	-	-	1	-	-	2
20EC5	CO4	Adapt effective Communication, presentation and report writing skills.	-	-	-	-	-	-	-	2	2	3	-	1

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
al Engineering	CO1	Illustrate the behavior of active and passive components, series and parallel circuits, self and mutual inductance of magnetic circuits, network functions and two port networks using basic laws in physic and mathematical equations and diagramicatal representations.	2	2	-	-	-	-	-	ı	-	1	-	-
20EE01 Basic Electrical Engineering	CO2	Interpret the working principles of AC and DC machines along with grounding and earthing using electrical engineering fundamentals and diagramicatal representations.	2	2	2	1	-	-	-	1	-	2	-	-
7	CO3	Apply mesh analysis, nodal analysis and network theorems to solve the Thevinen's voltage, Norton's current and maximum power transfer of the linear circuits.	3	2	1	2	-	-	-	-	-	2	-	-

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
	CO4	Analyze the concepts of bandwidth, quality factor of series and parallel resonant circuits mathematical equations and diagramicatal representations.	3	2	2	2			1			2	-	-
cal &	CO1	Apply network reduction techniques to simplify electrical circuits	3	2	-	-	-	-	-	-	-	-	-	1
20EE02 Basic Electrical & Electronics Engineering	CO2	Illustrate the working principle of DC machines and transformers	3	2	-	-	-	-	-	-	-	-	-	1
02 Basic tronics	CO3	Understand V-I characteristics of semiconductor devices	3	2	-	-	-	-	-	-	-	-	-	1
20EE Elec	CO4	Illustrate the configuration of Transistors and their applications	3	2	-	-	-	-	-	-	-	-	-	1
ronic	CO1	Illustrate the working of different types of diodes and their characteristics	3	2	-	-	-	-	-	-	-	-	-	1
Elect and D	CO2	Analyze the operation of diode rectifiers with filters	3	2	-	-	-	-	-	-	-	-	-	1
20EE03 Electronic circuits and Devices	CO3	Understand the working and characteristics of various transistor configurations	3	2	-	-	-	-	-	-	-	-	-	1

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
	CO4	Analyze the transistor biasing, stabilization and amplification circuits	3	2	-	-	-	-	-	-	-	-	-	1
ectrical	CO1	Apply network reduction techniques to simplify electrical circuits	3	2	3	-	-	-	-	-	-	-	-	1
als of Ele ing	CO2	Analyze the electrical circuits using fundamental laws	3	2	3	-	-	-	-	-	-	-	-	1
eer	CO <sub>3</sub>	Analyze magnetic circuits	3	2	-	-	-	-	-	-	-	-	_	1
20EE04 Fundamentals of Electrical Engineering	CO4	Identify a suitable measuring instrument to measure electrical variables	3	2	-	-	-	-	-	-	-	-	-	1
20EE0	CO5	Determine the circuit parameters using AC and DC bridges	3	2	-	-	-	-	-	-	-	-	-	1
asic   &   cs	CO1	Examine electrical circuits using network theorems	3	2	-	2	2	_	-	3	3	3	-	1
20EE52 Basic Electrical & Electronics	CO2	Analyze VI characteristics of semiconductor devices.	3	2	-	2	2	-	-	3	3	3	-	1
OEI Ele	CO3	Analyze electrical circuits	3	2	-	2	2	-	-	3	3	3	-	1
\ \delta \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	CO4	Design Resonance circuits	3	2	-	3	2	-	-	3	3	3	-	1
20EE53 Electronic circuits	CO1	Analyze the characteristics of diodes	3	2	-	-	2	_	-	2	2	2	1	1
20E Elect circ	CO2	Examine the performance of rectifiers with filters.	3	2	_	_	2	_	_	2	2	2	1	1

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
	CO3	Analyze the characteristics of BJT and FET.	3	2	-	-	2	-	-	2	2	2	1	1
	CO4	Design various transistor amplifier circuits.	3	2	ı	-	2	-	ı	2	2	2	1	1
n I	CO1	Write sentences and paragraphs using proper grammatical structures and word forms.	-	-	-	2	-	-	-	-	3	3	-	2
20FE01 Professional Communication I	CO2	Comprehend the given text by employing suitable strategies for skimming and scanning and draw inferences.	-	1	-	2	-	1	-	-	3	3	-	2
fessional (	CO3	Write summaries of reading texts using correct tense forms & appropriate structures.	-	-	-	2	-	-	-	-	3	3	-	2
)1 Pro	CO4	Write Formal Letters; Memos & E-Mails.	-	1	-	2	-	1	-	-	3	3	-	2
	CO5	Edit the sentences/short texts by identifying basic errors of grammar/vocabulary/synta x.	-	-	-	2	-	-	-	-	3	3	-	2
20FE02 Professi onal	CO1	Produce a coherent paragraph interpreting a figure / graph/ chart/ table.	-	-	-	2	-	-	-	-	3	3	-	2

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
	CO2	Comprehend the given texts thorughly by guessing the meanings of the words contextually.	1	1	-	2	-	1	1	1	3	3	-	2
	CO3	Use language appropriately for describing / comparing / contrasting / giving directions and suggestions.	1	-	-	2	-	-	1	1	3	3	-	2
	CO4	Write formal /informal dialouges with an understanding of verabl / non verbal features of communication. guess measings of the words from the context.	-	1	-	2	-	1	1	1	3	3	-	2
	CO5	Write well structured essays; Reports and Resume.	ı	1	-	2	-	1	ı	ı	3	3	-	2
ferrential ions	CO1	Apply first order and first-degree differential equations to find orthogonal trajectories.	3	2	-	2	-	-	-	-	-	-	-	1
20FE03 Differrential Equations	CO2	Distinguish between the structure and methodology of solving higher order differential equations with constant coefficients.	3	2	-	2	-	-	-	-	-	-	-	1

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
	CO3	Apply various Numerical methods to solve initial value problem.	3	2	-	2	-	-	-	-	-	-	-	1
	CO4	Generate the infinite series for continuous functions and investigate the functional dependence.	2	1	1	1	1	1	-	1	-	-	-	1
	CO5	Solve partial differential equations using Lagrange method.	3	2	-	2	-	-	-	-	-	-	-	1
mation	CO1	Investigate the consistency of equations and solve them.	3	2	-	2	-	-	-	-	-	-	-	1
and Transformation ques	CO2	Determine the Eigen Values, Inverse and Powers of a matrix using Cayley – Hamilton Theorem.	3	2	-	2	-	-	-	-	-	-	-	1
Algebra and Techniques	CO3	Use the concepts of Laplace Transforms to various forms of functions.	3	2	-	2	-	-	-	-	-	-	-	1
20FE04 Linear Algebra Technio	CO4	Solve Ordinary Differential Equations by using Laplace Transforms.	2	1	-	1	-	-	-	-	-	-	-	1
20FE04	CO5	Apply Z-Transforms to solve Difference Equations.	3	2	-	2	-	-	-	-	-	-	-	1

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
ics	CO1	Define the nature of interference and diffraction.	3	3	1	1	-	-	-	-	-	-	-	1
20FE07 Applied Physics	CO2	Apply the lasers and optical fibers in different fields.	3	3	2	1	-	-	-	-	-	-	-	1
Appli	CO3	Estimate the electrical conductivity of metals.	3	3	1	1	-	-	_	-	-	-	-	1
FE07	CO4	Analyze the properties of semiconducting materials.	3	3	1	1	-	-	-	-	-	-	-	1
20	CO5	Classify the different types of magnetic and dielectric materials.	3	3	1	1	-	-	-	-	-	-	-	1
sics	CO1	Analyse the different mechanical properties of materials.	3	3	1	1	-	-	-	-	-	-	-	1
ing Phy	CO2	Apply the lasers and optical fibres in different fields.	3	2	1	1	-	-	-	-	-	-	-	1
gineer	CO3	Summarize the properties of sound waves.	3	3	1	1	-	-	-	-	-	-	-	1
20FE08 Engineering Physics	CO4	Classify the different types of magnetic and dielectric materials.	3	3	1	1	-	-	-	-	-	-	-	1
20F	CO5	Identify the properties of superconducting and nano materials.	3	3	1	1	-	-	_	-	_	-	-	1

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
y	CO1	Apply Nernst Equation for calculating electrode cell potentials and compare batteries for different applications.	3	2	1	2	-	2	1	ı	-	-	-	2
20FE05 Applied Chemistry	CO2	Apply principles of corrosion for design and effective maintenance of various equipment.	3	2	2	1	-	2	2	-	-	-	-	2
E05 Applie	CO3	Analyse the suitability of advanced materials like nano materials in electronics and medicine.	3	2	2	1	1	2	1	ı	1	-	-	2
20F1	CO4	Identify the importance of liquid crystals, polymers in advanced technologies.	3	3	2	1	-	2	1	-	-	-	-	2
	CO5	Apply the principles of analytical techniques in chemical analysis.	3	2	2	1	-	1	1	ı	-	-	-	2
ional	CO1	Introduce oneself and others using appropriate language and details.	-	-	-	-	3	_	-	-	-	3	3	-
20FE51 Professional Communication	CO2	Comprehend short talks and speak clearly on a specific topic using error free English.	-	-	-	-	3	-	-	-	-	3	3	-

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
	CO3	Report effectively after participating in informal discussions ethically.	-	-	-	-	3	-	-	-	-	3	3	-
	CO4	Interpret data aptly, ethically & make oral presentations.	-	-	-	-	3	-	-	-	-	3	3	-
q	CO1	Analyze the wave characteristics of light.	3	3	1	1	-	1	-	-	1	-	-	1
sics Lal	CO2	Estimate the magnetic field using Stewart's and Gee's apparatus.	3	2	1	1	-	1	-	-	1	-	-	1
ed Phy	CO3	Verify the characteristics of semiconductor diodes.	3	2	1	1	-	-	-	1	1	-	-	1
20FE54 Applied Physics Lab	CO4	Determine the acceptance angle and numerical aperture of optical fiber.	3	2	1	1	-	-	-	-	1	-	-	1
20FE5	CO5	Improve report writing skills and individual teamwork with ethical values.	3	2	1	1	-	-	-	2	2	2	-	1
plied Lab	CO1	Assess quality of water based on the procedures given.	3	3	-	1	-	2	2	1	-	-	-	-
20FE52 Applied Chemistry Lab	CO2	Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus.	2	1	-	-	-	-	-	-	-	-	-	-

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
	CO3	Acquire practical knowledge related to preparation of polymers.	2		1	-	-	-	-	-	-	-	-	-
	CO4	Exhibit skills in performing experiments based on theoretical fundamentals.	3	2	1	-	-	-	-	-	1	-	-	-
sics	CO1	Analyse the different mechanical properties of materials.	3	3	1	1	-	-	-	-	-	-	-	1
20FE08 Engineering Physics	CO2	Apply the lasers and optical fibres in different fields.	3	2	1	1	-	-	-	-	1	-	-	1
gineer	CO3	Summarize the properties of sound waves.	3	3	1	1	-	-	-	-	-	-	-	1
E08 Eng	CO4	Classify the different types of magnetic and dielectric materials.	3	3	1	1	-	-	-	-	-	-	-	1
20F	CO5	Identify the properties of superconducting and nano materials.	3	3	1	1	-	-	-	-	1	-	-	1
20FE06 Engineering Chemistry	CO1	Apply Nernst Equation for calculating electrode cell potentials and compare batteries for different applications.	3	3	2	1	-	2	2	-	-	-	-	2

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
	CO2	Apply principles of corrosion for design and effective maintenance of variousequipment.	3	2	2	1	-	2	1	-	-	-	-	2
	CO3	Analyse the suitability of advanced materials like nano materials in electronics and medicine.	3	2	2	1	-	1	1	1	-	-	-	2
	CO4	Identify the importance of liquid crystals, polymers in advanced technologies.	3	2	2	1	-	1	1	-	-	-	-	2
	CO5	Apply the principles of analytical techniques in chemical analysis.	3	2	1	1	-	1	1	-	-	-	-	2
sics	CO1	Analyze the wave characteristics of light.	3	2	1	1	-	-	-	-	1	-	-	1
ing Phy	CO2	Determine the wavelength of laser source and width of slit.	3	2	1	1	-	-	-	-	1	-	-	1
20FE55 Engineering Physics Lab	CO3	Estimate the magnetic field using Stewart's and Gee's apparatus and the rigidity modulus of material using Torsional Pendulum.	3	2	1	1	-	-	-	-	1	-	-	1
20F	CO4	Identify the phenomena of resonance in strings.	3	2	1	1	-	-	-	-	1	-	-	1

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
	CO5	Improve report writing skills and individual team work with ethical values.	3	2	1	1	-	-	-	1	1	-	-	1
y Lab	CO1	Assess alkalinity of water based on the procedure given.	3	3	-	1	-	2	2	-	-	-	-	-
20FE53 Engineering Chemistry Lab	CO2	Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus.	2	1	-	-	-	-	-	-	-	-	-	-
Engineer	CO3	Acquire practical knowledge related to preparation of polymers.	2	-	1	-	-	-	-	1	-	-	-	-
20FE53]	CO4	Exhibit skills in performing experiments based on theoretical fundamentals.	3	2	1	-	-	-	-	-	-	-	-	
20IT51 IT Workshop	CO1	Identify the basic hardware components, keyboard shortcuts, assembling and disassembling of the system (PC).	3	-	-	-	-	-	-	1	-	-	-	-
20IT51 IT	CO2	Demonstrate Operating System installation, apply various commands of linux operating system, and networking.	3	-	-	-	-	-	-	-	-	-	-	-

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
	CO3	Create web pages using HTML, documents using applications like LaTeX, Google forms and use application software packages: MS-Word, MS-Excel, MS-Power Point to create documents and presentation.	3	1	-	-	3	-	-	1	-	-	-	-
	CO4	Improve individual / teamwork skills, communication & report writing skills with ethical values.	-	-	-	-	-	-	-	2	2	2	-	-
ion	CO1	Identify basic elements of programming structures.	2	-	-	-	2	-	-	-	-	-	-	-
rtical Applicat lb	CO2	Implement elementary mathematical operations using MATLAB/ SCI Lab or some other open-source tools.	2	1	-	-	2	-	-	-	-	-	-	-
20IT52 Mathematical Application Lab	CO3	Implement the binary operations using MATLAB/ SCI Lab or some other open-source tools.	2	1	-	-	2	-	-	-	-	-	-	-
2017	CO4	Improve individual / teamwork skills,	-	-	-	-	-	-	-	2	2	2	-	-

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
		communication & report writing skills with ethical values.												
	CO1	Understand history and philosophy of constitution with reference to Preamble, Fundamental Rights and Duties.	-	-	-	-	-	3	3	3	-	2	-	3
20MC01 Constitution of India	CO2	Understand the concept of Unitary and Federal Government along with therole of President, Prime Minister and Judicial System	-	-	-	-	-	3	2	3	-	2	-	3
C01 Constitut	CO3	Understand the structure of the state government, Secretariat, Governor and Chief Minister and their functions	-	-	-	-	-	3	3	3	-	2	-	3
20M	CO4	Learn local administration viz. Panchayat, Block, Municipality and Corporation.	-	-	-	-	-	3	2	3	-	2	-	3
	CO5	learn about Election Commission and the process and about SC, ST, OBC and women	-	-	-	-	-	3	3	3	-	2	-	3

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
	CO1	Identify the geometrical objects considering BIS standards.	2	3	1	1	1	0	0	3	1	1	0	2
20ME01 Engineering Graphics	CO2	Comprehend the basics of orthographic projections and deduce orthographic projections of a point and a line at different orientations.	3	3	1	2	1	0	0	1	1	1	0	2
Engineerin	CO3	Analyse and represent graphically the geometrical planes at different positions and orientations.	2	3	1	2	1	0	0	1	2	1	0	2
0ME01	CO4	Analyze and draw solid objects at different positions and orientations	2	3	1	2	1	0	0	1	2	1	0	2
20MI	CO5	Visualize isometric and orthographic views of geometrical objects and convert one form to another.	3	3	3	3	2	2	0	2	2	1	0	2
202 ering nics	CO1	Analyze the coplanar force systems using free body diagram.	3	2	-	1	-	-	-	-	-	-	-	2
20ME02 Engineering Mechanics	CO2	Apply the equilibrium Equations of rigid bodies associated with frictional forces.	2	3	1	-	-	-	-	-	-	-	-	2

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
	CO3	Identify the location of centroid / centre of gravity and evaluate the moment of inertia of plane sections/solids.	3	2	-	-	-	-	-	-	-	-	-	2
	CO4	Understand the behaviour of moving bodies in rectilinear motion usingkinematic equations or motion curves.	2	2	1	-	-	-	-	-	-	-	-	2
	CO5	Examine the behaviour of moving bodies using dynamic equilibrium conditions.	3	2	-	-	-	-	-	-	-	-	-	2
ring	CO1	Develop different prototypes in the carpentry section.	1	2	1	2	-	2	-	-	3	1	-	3
ginee: hop	CO2	Fabricate various basic prototypes in fitting trade	1	2	1	2	-	2	-	-	3	1	-	3
20ME51 Engineering Workshop	CO3	Demonstrate various operations related to plumbing, tin smithy and black smithy	1	2	1	1	-	2	-	-	3	1	-	3
, ,	CO4	Perform various basic house wiring techniques	1	2	1	2	-	2	_	-	3	1	-	3
20M E52 Engi	CO1	Verify the basic laws of mechanics.	2	1	-	2	-	-	-	-	3	2	-	-

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
	CO2	Evaluate the forces in mechanical systems.	2	1	-	2	-	-	-	-	3	2	-	-
	CO3	Estimate various properties of fuel like viscosity, flash and fire point.	1	1	-	2	-	-	-	-	3	2	-	-
	CO4	Determine calorific-value of fuels.	1	1	-	2	-	-	-	-	3	2	-	-
20ME53 Computer Aided Engineering Drawing	CO1	Understand the Auto-CAD basics and apply to solve practical problems used in industries where the speed and accuracy can be achieved.	-	-	-	-	3	-	-	-	-	-	-	2
nputer Aide Drawing	CO2	Understand the principle of Orthographic projections of points, lines, planes and solids	2	1	-	-	3	-	-	-	-	-	-	2
E53 Con	CO3	Draw the isometric views of lines, planes and simple solids	2	1	-	-	3	-	-	-	-	2	-	2
. ,	CO4	Convert orthographic to isometric vice versa.	2	-	-	-	3	_	-	-	-	2	-	2
20ME54- Computer Aided	CO1	Understand the Auto-CAD basics and apply to solve practical problems used in industries.	-	-	-	-	3	-	-	-	-	-	-	2

Course	CO		PO	PO1	PO1	PO1								
Name	No.	Course Outcomes	1	2	3	4	5	6	7	8	9	0	1	2
		Draw the Orthographic												
		projections of points, lines,		-	-	-			-	-	-	-	-	
	CO <sub>2</sub>	planes and solids.	2				3	-						2
		Familiarize (Demonstrate												
		sections of solids and												
		development of surfaces)										2		
		with the section of solids		-	-	-		_	-	-	-	2	-	
		and development of												
	CO <sub>3</sub>	surfaces.	2				3							2
		Convert orthographic												
		projections to isometric		_	-	_		_	_	-	-	2	_	
	CO4	views and vice versa.	2				3							2