



SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

B.TECH - FULL TIME (UG - 2021)

COURSE CODE	COURSE TITLE	CO	COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO3
21147S11	PROFESSIONAL ENGLISH I	CO 1	To improve the communicative competence of learners	1	1	1	1	1	3	3	3	1	3	-	3	-	-	-
		CO 2	To learn to use basic grammatic structures in suitable contexts	1	1	1	1	1	3	3	3	1	3	-	3	-	-	-
		CO 3	To acquire lexical competence and use them appropriately in a sentence and understand their meaning in a text	2	3	2	3	2	3	3	3	2	3	3	3	-	-	-
		CO4	To help learners use language effectively in professional contexts	2	3	2	3	2	3	3	3	2	3	3	3	-	-	-
		CO5	To develop learners' ability to read and write complex texts, summaries, articles, blogs, definitions, essays and user manuals.	2	3	3	3	-	3	3	3	2	3	-	3	-	-	-
		Avg		1.6	2.2	1.8	2.2	1.5	3	3	3	1.6	3	3	3	-	-	-

21148S12	MATRICES AND CALCULUS	1	To develop the use of matrix algebra techniques that is needed by engineers for practical applications.	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
		2	To familiarize the students with differential calculus.	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
		3	To familiarize the student with functions of several variables. This is needed in many branches of engineering.	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
		4	To make the students understand various techniques of integration.	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
		5	To acquaint the student with mathematical tools needed in evaluating multiple integrals and their applications	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
		Av g.		3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
21149S13	ENGINEERING PHYSICS	1	To make the students effectively to achieve an understanding of mechanics.	3	3	2	1	1	1	-	-	-	-	-	-	-	-	-
		2	To enable the students to gain knowledge of electromagnetic waves and its applications.	3	3	2	1	2	1	-	-	-	-	-	-	-	-	-
		3	To introduce the basics of oscillations, optics and lasers.	3	3	2	2	2	1	-	-	-	-	-	1	-	-	-
		4	Equipping the students to be successfully understand the importance of quantum physics.	3	3	1	1	2	1	-	-	-	-	-	-	-	-	-
		5	To motivate the students towards the applications of quantum mechanics.	3	3	1	1	2	1	-	-	-	-	-	-	-	-	-
		Av g.		3	3	1.6	1.2	1.8	1	-	-	-	-	-	1	-	-	-
21149S14	ENGINEERING CHEMISTRY	1	To make the students conversant with boiler feed water requirements, related problems and water treatment techniques.	3	2	2	1	-	1	1	-	-	-	-	1	-	-	-

21150S15		2	To develop an understanding of the basic concepts of phase rule and its applications to single and two component systems and appreciate the purpose and significance of alloys.	2	-	-	1	-	2	2	-	-	-	-	-	-	-	
		3	Preparation, properties and applications of engineering materials.	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-
		4	Types of fuels, calorific value calculations, manufacture of solid, liquid and gaseous fuels.	3	1	1	-	-	1	2	-	-	-	-	-	-	-	-
		5	Principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells	3	1	2	1	-	2	2	-	-	-	-	2	-	-	-
		Av g.		2.8	1.3	.6	1	1	-	1.5	.8	1	-	-	-	-	1.5	-
	PROBLEM SOLVING AND PYTHON PROGRAMMING	1	Develop algorithmic solutions to simple computational problems.	3	3	3	3	2	-	-	-	-	-	2	2	3	3	-
		2	Develop and execute simple Python programs.	3	3	3	3	2	-	-	-	-	-	2	2	3	-	-
		3	Write simple Python programs using conditionals and loops for solving problems.	3	3	3	3	2	-	-	-	-	-	2	-	3	-	-
		4	Decompose a Python program into functions.	2	2	-	2	2	-	-	-	-	-	1	-	3	-	-
		5	Represent compound data using Python lists, tuples, dictionaries etc.	1	2	-	-	1	-	-	-	-	-	1	-	2	-	-
6		Read and write data from/to files in Python programs.	2	2	-	-	2	-	-	-	-	-	1	-	2	-	-	
Av g.			2	3	3	3	2	-	-	-	-	-	2	2	3	3	-	
21150L16	PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY	1	Develop algorithmic solutions to simple computational problems	3	3	3	3	3	-	-	-	-	-	3	2	3	3	-

		2	Develop and execute simple Python programs.	3	3	3	3	3	-	-	-	-	-	3	2	3	-	-	
		3	Implement programs in Python using conditionals and loops for solving problems..	3	3	3	3	2	-	-	-	-	-	2	-	3	-	-	
		4	Deploy functions to decompose a Python program.	3	2	-	2	2	-	-	-	-	-	1	-	3	-	-	
		5	Process compound data using Python data structures.	1	2	-	-	1	-	-	-	-	-	1	-	2	-	-	
		6	Utilize Python packages in developing software applications.	2	-	-	-	2	-	-	-	-	-	1	-	2	-	-	
		Avg.		2	3	3	3	2	-	-	-	-	-	2	2	3	3	-	
21149L17	PHYSICS AND CHEMISTRY LABORATORY	1	Understand the functioning of various physics laboratory equipment.	3	2	3	1	1	-	-	-	-	-	-	-	-	-	-	
		2	Use graphical models to analyze laboratory data	3	3	2	1	1	-	-	-	-	-	-	-	-	-	-	-
		3	Use mathematical models as a medium for quantitative reasoning and describing physical reality.	3	2	3	1	1	-	-	-	-	-	-	-	-	-	-	-
		4	Access, process and analyze scientific information	3	3	2	1	1	-	-	-	-	-	-	-	-	-	-	-
		5	Solve problems individually and collaboratively	3	2	3	1	1	-	-	-	-	-	-	-	-	-	-	-
		Avg .		3	2.4	2.6	1	1	-	-	-	-	-	-	-	-	-	-	-
21147L18	COMMUNICATION LABORATORY - I	1	To listen to and comprehend general as well as complex academic information	3	3	3	3	1	3	3	3	3	3	3	3	-	-	-	
		2	To listen to and understand different points of view in a discussion	3	3	3	3	1	3	3	3	3	3	3	3	3	-	-	-
		3	To speak fluently and accurately in formal and informal communicative contexts	3	3	3	3	1	3	3	3	3	3	3	3	3	-	-	-

		4	To describe products and processes and explain their uses and purposes clearly and accurately	3	3	3	3	1	3	3	3	3	3	3	3	-	-	-	
		5	To express their opinions effectively in both formal and informal discussions	3	3	3	3	1	3	3	3	3	3	3	3	-	-	-	
		Avg .		3	3	3	3	1	3	3	3	3	3	3	3	-	-	-	
21147S21	PROFESSIONAL ENGLISH – II	1	To compare and contrast products and ideas in technical texts.	3	3	3	3	3	3	3	3	2	3	3	3	-	-	-	
		2	To identify and report cause and effects in events, industrial processes through technical texts	3	3	3	3	3	3	3	3	2	3	3	3	3	-	-	-
		3	To analyse problems in order to arrive at feasible solutions and communicate them in the written format.	3	3	3	3	3	3	3	3	2	3	3	3	3	-	-	-
		4	To present their ideas and opinions in a planned and logical manner	3	3	3	3	2	3	3	3	2	3	3	3	3	-	-	-
		5	To draft effective resumes in the context of job search.	-	-	-	-	-	-	-	-	3	3	3	3	3	-	-	-
		Av g.		3	3	3	3	2.7 5	3	3	3	2.2	3	3	3	3	-	-	-
21148S22 A	STATISTICS AND NUMERICAL METHODS	1	Apply the concept of testing of hypothesis for small and large samples in real life problems.	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-	
		2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.	3	3	1	1	1	0	0	0	2	0	2	3	3	-	-	-
		3	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems	3	3	1	1	1	0	0	0	2	0	2	3	3	-	-	-

		4	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-	
		5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-	
		Av g.		3	3	1	1	1	0	0	0	2	0	2	3	-	-	-	
21149S23 C	PHYSICS FOR ELECTRICAL ENGINEERING	1	know basics of dielectric materials and insulation.	3	2	1	-	-	1	-	-	-	-	-	-	-	-	-	
		2	gain knowledge on the electrical and magnetic properties of materials and their applications	3	2	1	-	-	1	-	-	-	-	-	-	-	-	-	-
		3	understand clearly of semiconductor physics and functioning of semiconductor devices	3	2	1	-	-	1	-	-	-	-	-	-	-	-	-	-
		4	understand the optical properties of materials and working principles of various optical devices	3	2	1	-	-	1	-	-	-	-	-	-	-	-	-	-
		5	appreciate the importance of nanotechnology and nanodevices.	3	2	1	-	-	1	-	-	-	-	-	-	-	-	-	-
		Av g.		3	2	1			1	-	-	-	-	-	-	-	-	-	-
21154S24	ENGINEERING GRAPHICS	1	Use BIS conventions and specifications for engineering drawing.	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-	
		2	Construct the conic curves, involutes and cycloid.	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-	
		3	Solve practical problems involving projection of lines.	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-	
		4	Draw the orthographic, isometric and perspective projections of simple solids.	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-	

		5	Draw the development of simple solids.	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
		Av g.		3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
21154S25	BASIC CIVIL AND MECHANICAL ENGINEERING	1	Understanding profession of Civil and Mechanical engineering.	2	-	-	1	-	-	1	2	1	2	-	1	-	-	-
		2	Summarise the planning of building, infrastructure and working of Machineries.	2	-	-	-	-	-	1	2	1	2	-	2	-	-	-
		3	Apply the knowledge gained in respective discipline	2	-	-	-	-	-	1	2	2	2	-	2	-	-	-
		4	Illustrate the ideas of Civil and Mechanical Engineering applications.	2	-	-	-	-	-	1	2	1	2	-	2	-	-	-
		5	Appraise the material, Structures, machines and energy.	2	-	-	-	-	-	1	2	1	2	-	2	-	-	-
		Av g.		2	-	-	0.2	-	-	1	2	1.2	2	-	1.8	-	-	-
21153S26 B	ELECTRIC CIRCUIT ANALYSIS	CO 1	Explain circuit's behavior using circuit laws.	3	3	3	2	2	-	2	1	-	-	-	3	3	3	3
		CO 2	Apply mesh analysis/ nodal analysis / network theorems to determine behavior of the given DC and AC circuit	3	3	3	3	2	-	2	1	-	-	-	3	3	3	3
		CO 3	Compute the transient response of first order and second order systems to step and sinusoidal input	3	3	3	3	2	-	2	1	-	-	-	3	3	3	3
		CO 4	Compute power, line/ phase voltage and currents of the given three phase circuit	3	3	3	3	2	-	2	1	-	-	-	3	3	3	3
		CO 5	Explain the frequency response of series and parallel RLC circuits	3	3	3	3	2	-	2	1	-	-	-	3	3	3	3
		CO 6	Explain the behavior of magnetically coupled circuits.	3	3	3	3	2	-	2	1	-	-	-	3	3	3	3
		Av g.		3	3	3	2.8	2	-	2	1	-	-	-	3	3	3	3

21154L27	ENGINEERING PRACTICES LABORATORY	1	Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work.	3	2	-	-	1	1	1	-	-	-	-	2	2	1	1
		2	Wire various electrical joints in common household electrical wire work.	3	2	-	-	1	1	1	-	-	-	-	2	2	1	1
		3	Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work.	3	2	-	-	1	1	1	-	-	-	-	2	2	1	1
		Av g.		3	2	-	-	1	1	1	-	-	-	-	2	2	1	1
21153L28 B	ELECTRIC CIRCUITS LABORATORY	1	Use simulation and experimental methods to verify the fundamental electrical laws for the given DC/AC circuit (Ex 1)	3	3	3	3	3	-	2	1.5	3	-	-	3	3	3	2
		2	Use simulation and experimental methods to verify the various electrical theorems (Superposition, Thevenin , Norton and maximum power transfer) for the given DC/AC circuit (Ex 2-5)	3	3	3	3	3	-	2	1.5	3	-	-	3	3	3	2
		3	Analyze transient behavior of the given RL/RC/RLC circuit using simulation and experimental methods (Ex 6)	3	3	3	3	3	-	2	1.5	3	-	-	3	3	3	2
		4	Analyze frequency response of the given series and parallel RLC circuit using simulation and experimentation methods (Ex 7-8)	3	3	3	3	3	-	2	1.5	3	-	-	3	3	3	2
		5	Analyze frequency response of the given series and parallel RLC circuit using simulation and experimentation methods (Ex 7-8)	3	3	3	3	3	-	2	1.5	3	-	-	3	3	3	2
		Av g.		3	3	3	3	3	-	2	1.5	3	-	-	3	3	3	2

21147L29	COMMUNICATIO N LABORATORY - II	1	Speak effectively in group discussions held in formal/semi formal contexts.	1	2	3	3	3	1	3	3	3	3	3	3	3	-	-	
		2	Discuss, analyse and present concepts and problems from various perspectives to arrive at suitable solutions	2	2	3	3	3	1	3	3	3	3	3	3	3	3	-	-
		3	Write emails, letters and effective job applications.	3	2	2	3	3	1	3	3	3	3	3	3	3	3	-	-
		4	Write critical reports to convey data and information with clarity and precision	4	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-
		5	Give appropriate instructions and recommendations for safe execution of tasks	5	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-
		Av g.		Av g.	2.4	2.8	3	3	1.8	3	3	3	3	3	3	3	3	-	-
21148S31 C	PROBABILITY AND COMPLEX FUNCTIONS	1	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.	3	3	0	0	0	0	0	0	2	0	0	2	-	-	-	
		2	Understand the basic concepts of one and two dimensional random variables and apply in engineering applications.	3	3	0	0	0	0	0	0	0	2	0	0	2	-	-	-
		3	To develop an understanding of the standard techniques of complex variable theory in particular analytic function and its mapping property.	3	3	0	0	0	0	0	0	0	2	0	0	2	-	-	-
		4	To familiarize the students with complex integration techniques and contour integration techniques which can be used in real integrals.	3	3	0	0	0	0	0	0	0	2	0	0	2	-	-	-
		5	To acquaint the students with Differential Equations which are significantly used in engineering problems.	3	3	0	0	0	0	0	0	0	2	0	0	2	-	-	-
		Av g.		3	3	0	0	0	0	0	0	0	2	0	0	2	-	-	-

21153C32	DIGITAL LOGIC CIRCUITS	CO 1	Explain various number systems and characteristics of digital logic families	3	3	3	1	3	-	-	1	-	-	-	1	3	-	1
		CO 2	Apply K-maps and Quine McCluskey methods to simplify the given Boolean expressions	3	3	3	1	3	-	-	1	-	-	-	1	3	-	1
		CO 3	Explain the implementation of combinational circuit such as multiplexers and demultiplexers - code converters, adders, subtractors, Encoders and Decoders	3	3	3	1	3	-	-	1	-	-	-	1	3	-	1
		CO 4	Design various synchronous and asynchronous circuits using Flip Flops	3	3	3	1	3	-	-	1	-	-	-	1	3	-	1
		CO 5	Explain asynchronous sequential circuits and programmable logic devices	3	3	3	1	3	-	-	1	-	-	-	1	3	-	1
		Av g	Use VHDL for simulating and testing RTL, combinatorial and sequential circuits	3	3	3	1	3	-	-	1	-	-	-	1	3	-	1
21153C33	ELECTROMAGNETIC FIELDS	CO 1	Visualize and explain Gradient, Divergence, and Curl operations on electromagnetic vector fields and identify the electromagnetic sources and their effects.	3	2	-	-	-	-	3	1	-	-	-	1	3	2	1
		CO 2	Compute and analyse electrostatic fields, electric potential, energy density along with their applications.	3	2	1	2	-	-	1	1	-	-	-	1	3	2	1
		CO 3	Compute and analyse magneto static fields, magnetic flux density, vector potential along with their applications	3	2	1	2	-	-	1	1	-	-	-	1	3	2	1
		CO 4	Explain different methods of emf generation and Maxwell's equations	3	2	1	2	-	-	1	1	-	-	-	1	3	2	1
		CO 5	Explain the concept of electromagnetic waves and characterizing parameters	3	2	1	2	-	-	1	1	-	-	-	1	3	2	1
		Av g.		3	2	1	2	-	-	1.4	1	-	-	-	1	3	2	1
21153C34	ELECTRICAL MACHINES – I	CO 1	Apply the laws governing the electromechanical energy conversion for singly and multiple excited systems.	3	3	1	1	1	-	-	1	-	-	-	1	3	2	2

		CO 2	Explain the construction and working principle of DC machines.	3	3	1	1	1	-	-	1	-	-	-	1	3	1	1
		CO 3	Interpret various characteristics of DC machines.	3	3	1	1	1	-	-	1	-	-	-	1	3	1	1
		CO 4	Compute various performance parameters of the machine, by conducting suitable tests	3	3	1	1	1	-	-	1	-	-	-	1	3	3	2
		CO 5	Draw the equivalent circuit of transformer and predetermine the efficiency and regulation.	3	3	1	1	1	-	-	1	-	-	-	1	3	3	2
		CO 6	Describe the working principle of auto transformer, three phase transformer with different types of connections.	3	3	1	1	1	-	-	1	-	-	-	1	3	3	2
		Av g		3	3	1	1	1	-	-	1	-	-	-	1	3	3	3
21153S35	ELECTRON DEVICES AND CIRCUITS	CO 1	Explain the structure and operation of PN junction devices (diode, Zener diode, LED and Laser diode)	2	2	3	2	2	-	-	1	-	-	-	1	3	-	1
		CO 2	Design clipper, clamper, half wave and full wave rectifier, regulator circuits using PN junction diodes	2	2	3	2	2	-	-	1	-	-	-	1	3	-	1
		CO 3	Analyze the structure and characteristics BJT, FET, MOSFET, UJT, Thyristor and IGBT	2	2	3	2	2	-	-	1	-	-	-	1	3	-	1
		CO 4	Analyze the performance of various configurations of BJT and MOSFET based amplifier	2	2	3	2	2	-	-	1	-	-	-	1	3	-	1
		CO 5	Explain the characteristics of MOS based cascade and differential amplifier	2	2	3	2	2	-	-	1	-	-	-	1	3	-	1
		Av g.	Explain the operation of various feedback amplifiers and oscillators	2	2	3	2	2	-	-	1	-	-	-	1	3	-	1
21153S36	C PROGRAMMING AND DATA STRUCTURES	1	Develop C programs for any real world/technical application	2	3	1	2	2	1	1	-	1	2	1	3	2	1	3

		2	Apply advanced features of C in solving problems	1	2	1	2	2	-	-	-	1	1	1	2	2	2	2
		3	Write functions to implement linear and non-linear data structure operations.	2	3	1	2	3	-	-	-	1	1	1	2	2	1	2
		4	Suggest and use appropriate linear/non-linear data structure operations for solving a given problem.	2	1	-	1	1	-	-	-	2	1	1	2	2	3	1
		5	Appropriately use sort and search algorithms for a given application.	1	2	1	2	2	1	1	-	1	2	1	3	2	2	3
		Av g.	Apply appropriate hash functions that result in a collision free scenario for data storage and retrieval.	2	2	1	2	2	1	1	-	1	1	1	2	2	2	2
21153L37	ELECTRONIC DEVICES AND CIRCUITS LABORATORY	CO 1	Analyze the characteristics of PN, Zener diode and BJT in CE,CC,CB configurations experimentally	-	-	-	3	3	-	-	1.5	-	-	3	-	-	3	3
		CO 2	Analyze the characteristics of JFET and UJT experimentally	-	-	3	3	3	-	-	1.5	-	-	3	-	-	3	3
		CO 3	Analyze frequency response characteristics of a Common Emitter amplifier experimentally	-	3	2	3	-	-	-	1.5	-	-	3	-	-	3	3
		CO 4	Analyze the characteristics of RC phase shift and LC oscillators experimentally	-	3	3	3	-	-	-	1.5	-	-	3	-	-	3	3
		CO 5	Analyze the characteristics of half-wave and full-wave rectifier with and without	-	-	-	-	3	-	-	1.5	-	-	-	-	-	3	3
		CO 6	Analyze the characteristics of FET based differential amplifier experimentally	-	-	-	-	3	-	-	1.5	-	-	-	-	-	3	3
		CO 7	Calculate the frequency and phase angle using CRO experimentally	-	-	-	-	3	-	-	1.5	-	-	3	-	-	3	3
		CO 8	Analyze the frequency response characteristics of passive filters experimentally	-	-	-	-	3	-	-	1.5	-	-	3	-	-	3	3

		Av g		-	3	2.7	3	3	-	-	1.5	-	-	3	-	-	3	3
21153L38	ELECTRICAL MACHINES LABORATORY-I	CO 1	Construct the circuit with appropriate connections for the given DC machine/transformer	3	3	1	1	-	-	-	-	1	-	-	-	3	1	1
		CO 2	Experimentally determine the characteristics of different types of DC machines	3	3	1	1	-	-	-	-	1	-	-	-	3	3	2
		CO 3	Demonstrate the speed control techniques for a DC motor for industrial applications.	3	3	1	1	-	-	-	-	1	-	-	-	3	3	2
		CO 4	Identify suitable methods for testing of transformer and DC machines.	3	3	1	1	-	-	-	-	1	-	-	-	2	3	2
		CO 5	Predetermine the performance parameters of transformers and DC motor.	3	3	1	1	-	-	-	-	1	-	-	-	2	3	2
		CO 6	Understand DC motor starters and 3-phase transformer connections.	3	3	1	1	-	-	-	-	1	-	-	-	2	3	1
		Av g		3	3	1	1	-	-	-	-	1	-	-	-	2.5	2.6	1.6
21153L39	C PROGRAMMING AND DATA STRUCTURES LABORATORY	1	Use different constructs of C and develop applications	2	3	1	2	2	1	1	-	1	2	1	3	2	1	3
		2	Write functions to implement linear and non-linear data structure operations	1	2	1	2	2	-	-	-	1	1	1	2	2	2	2
		3	Suggest and use the appropriate linear / non-linear data structure operations for a given problem	2	3	1	2	3	-	-	-	1	1	1	2	2	1	2
		4	Apply appropriate hash functions that result in a collision free scenario for data storage and Retrieval	2	1	-	1	1	-	-	-	2	1	1	2	2	3	1
		5	Implement Sorting and searching algorithms for a given application	1	2	1	2	2	1	1	-	1	2	1	3	2	2	3

		Av g.		2	2	1	2	2	1	1	-	1	1	1	2	2	2	2
21153L3 4	PROFESSIONAL DEVELOPMENT	1	Use MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements	2	3	1	2	3	-	-	-	1	1	1	2	2	1	2
		2	Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding	2	1	-	1	1	-	-	-	2	1	1	2	2	3	1
21153C41	ELECTRICAL MACHINES - II	CO 1	Ability to understand the construction and working principle of Synchronous generator	3	3	2	3	3	-	-	1	-	-	-	-	3	3	2
		CO 2	Ability to understand the construction and working principle of Synchronous Motor	3	3	2	3	3	-	-	1	-	-	-	-	3	3	2
		CO 3	Ability to understand the construction and working principle of Three Phase Induction Motor	3	3	2	3	3	-	-	1	-	-	-	-	3	3	2
		CO 4	Acquire knowledge about the starting and speed control of induction motors.	3	3	2	3	3	-	-	1	-	-	-	-	3	3	2
		CO 5	To gain knowledge about the basic principles and working of Single phase induction motors and Special Electrical Machines	3	3	1	1	2	-	-	1	-	-	-	-	3	3	2
		Av g		3	3	1.6	2.3	2.6	-	-	1	-	-	-	-	3	3	2
21153C42	TRANSMISSION AND DISTRIBUTION	CO 1	Understand the structure of power system, computation of transmission line parameters for different configurations.	2	1	-	-	-	-	-	1	-	-	-	-	3	1	1
		CO 2	Model the transmission lines to determine the line performance and to understand the impact of Ferranti effect and corona on line performance.	3	2	1	1	-	1	-	2	-	-	-	-	3	2	1
		CO 3	Do Mechanical design of transmission lines, grounding and to understand about the insulators in transmission system	3	2	1	1	-	1	-	2	-	-	-	-	3	3	1

		CO 4	Design the underground cables and understand the performance analysis of underground cable	3	2	1	1	-	1	-	2	-	-	-	-	3	3	1	
		CO 5	Understand the modelling, performance analysis and modern trends in distribution system.	3	2	1	1	-	1	-	2	-	-	-	-	3	3	1	
		Avg		2.8	1.8	1	1		1	-	1.8					3	2.4	1	
21153C43	MEASUREMENTS AND INSTRUMENTATION	CO 1	Ability to understand the fundamental art of measurement in engineering	3	2	3	-	3	2	-	2	-	-	-	3	3	3	3	
		CO 2	Ability to understand the structural elements of various instruments.	3	2	3	2	-	-	-		-	3	-	3	3	3	3	3
		CO 3	Ability to understand the importance of bridge circuits.	3	2	3	-	3	2	-		-	-	-	3	3	3	3	3
		CO 4	: Ability to understand about various transducers and their characteristics by	3	2	3	-	-	-	-	2	-	-	-	-	-	3	3	3
		CO 5	Ability to understand the concept of digital instrumentation and virtual instrumentation by experiments.	3	2	3	2	3	-	-		-	3	-	3	3	3	3	3
		Avg		3	2	3	2	3	2	-	2	-	3	-	3	3	3	3	3
21153C44	LINEAR INTEGRATED CIRCUITS	CO 1	Explain monolithic IC fabrication process	2	2	3	2	2	-	-	1	-	-	-	1	3	2	1	
		CO 2	Explain the fabrication of diodes, capacitance, resistance, FETs and PV Cell.	2	2	3	2	2	-	-	1	-	-	-	1	3	2	1	
		CO 3	Analyze the characteristics and basic applications (inverting/non-inverting amplifier, summer, differentiator, integrator, V/I and I/V converter) of Op-Amp	2	2	3	2	2	-	-	1	-	-	-	1	3	2	1	

		CO 4	Explain circuit and applications of op-amp based instrumentation amplifier, log/antilog amplifier, analog multiplier /divider, active filters, comparators, waveform generators, A/D and D/A converters	2	2	3	2	2	-	-	1	-	-	-	1	3	2	1
		CO 5	Explain Functional blocks, characteristics and applications of Timer, PLL, analog multiplier ICs.	2	2	3	2	2	-	-	1	-	-	-	1	3	2	1
		Av g	Explain the applications of ICs in Instrumentation amplifier, fixed and variable voltage regulator, SMPS and function generator	2	2	3	2	2	-	-	1	-	-	-	1	3	2	1
21153C4 5	MICROPROCESSOR AND MICROCONTROLLER	CO 1	Ability to write assembly language program for microprocessor and microcontroller	2	1	2	3	-	-	-	1	-	-	-	3	3	1	3
		CO 2	Ability to design and implement interfacing of peripheral with microprocessor and microcontroller	2	1	2	3	-	-	-	1	-	-	-	3	3	1	3
		CO 3	Ability to analyze, comprehend, design and simulate microprocessor based systems used for control and monitoring.	2	1	2	3	-	-	-	1	-	-	-	3	3	1	3
		CO 4	Ability to analyze, comprehend, design and simulate microcontroller based systems used for control and monitoring.	2	1	2	3	-	-	-	1	-	-	-	3	3	1	3
		CO 5	Ability to understand and appreciate advanced architecture evolving microprocessor field	2	1	2	3	-	-	-	1	-	-	-	3	3	1	3
		Av g		2	1	2	3	-	-	-	1	-	-	-	3	3	1	3
21149S4 6	ENVIRONMENTAL SCIENCES AND SUSTAINABILITY	1	To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.	2	1	-	-	-	2	3	-	-	-	-	2	-	-	-

		2	To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society.	3	2	-	-	-	3	3	-	-	-	-	2	-	-	-
		3	To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.	3	-	1	-	-	2	2	-	-	-	-	2	-	-	-
		4	To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development.	3	2	1	1	-	2	2	-	-	-	-	2	-	-	-
		5	To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.	3	2	1	-	-	2	2	-	-	-	-	1	-	-	-
		Av g.		2.8	1.8	1	1	-	2.2	2.4	-	-	-	-	.8 ¹	-	-	-
21153L47	ELECTRICAL MACHINES LABORATORY - II	CO 1	Ability to understand and analyze EMF and MMF methods	3	3	1	1	-	-	-	1.5	1	-	-	3	3	3	2
		CO 2	Ability to analyze the characteristics of V and Inverted V curves	3	3	1	1	-	-	-	1.5	1	-	-	3	3	3	2
		CO 3	Acquire hands on experience of conducting various tests on alternators and obtaining their performance indices using standard analytical as well as graphical methods. to understand the importance of Synchronous machines	3	3	1	1	-	-	-	1.5	1	-	-	3	3	3	1

		CO 4	Acquire hands on experience of conducting various tests on induction motors and obtaining their performance indices using standard analytical as well as graphical methods. to understand the importance of single and three phase Induction motors	3	3	1	1	-	-	-	1.5	1	-	-	3	3	3	1
		CO 5	Ability to acquire knowledge on separation of losses	3	3	1	1	-	-	-	1.5	1	-	-	2	3	3	2
		Av g		3	3	1	1	-	-	-	1.5	1	-	-	2.8	3	3	1.6
21153L48	LINEAR AND DIGITAL CIRCUITS LABORATORY	CO 1	Ability to understand and implement Boolean Functions	-	-	-	3	-	-	-	1.5	-	-	3	3	2	1	2
		CO 2	Ability to understand the importance of code conversion	-	-	3	3	-	-	-	1.5	-	-	3	3	2	1	2
		CO 3	Ability to Design and implement circuits with digital ICs like decoders, multiplexers, register.	-	3	2	3	3	-	-	1.5	-	-	3	3	2	1	2
		CO 4	Ability to acquire knowledge on Application of Op-Amp	-	3	3	3	3	-	-	1.5	-	-	3	3	2	1	2
		CO 5	Ability to Design and implement counters using analog ICs like timers, VCOs and digital ICs like Flip-flops and counters	-	-	-	-	-	-	-	1.5	-	-	-	3	-	-	-
		Av g		-	3	1.6	3	3	-	-	1.5	-	-	3	3	2	1	2
21153L49	MICROPROCESSOR AND MICROCONTROLLER LABORATORY	CO 1	Ability to write assembly language program for microprocessor	2	1	2	3	-	-	-	1.5	-	-	-	3	3	1	3
		CO 2	Ability to write assembly language program for microcontroller	2	1	2	3	-	-	-	1.5	-	-	-	3	3	1	3

		CO 3	Ability to design and implement interfacing of peripheral with microprocessor and microcontroller	2	1	2	3	-	-	-	1.5	-	-	-	3	3	1	3
		CO 4	Ability to analyze, comprehend, design and simulate microprocessor based systems used for control and monitoring	2	1	2	3	-	-	-	1.5	-	-	-	3	3	1	3
		CO 5	Ability to analyze, comprehend, design and simulate microcontroller based systems used for control and monitoring	2	1	2	3	-	-	-	1.5	-	-	-	3	3	1	3
		Av g		2	1	2	3	-	-	-	1.5	-	-	-	3	3	1	3
21153C51	POWER SYSTEM ANALYSIS	CO 1	Ability to model the power system under steady state operating condition.	3	2	2	1	1	-	-	-	1	-	-	-	1	-	2
		CO 2	Ability to carry out power flow analysis using.	3	3	3	2	1	-	-	-	1	-	-	-	1	1	1
		CO 3	Ability to infer the significance of short circuit studies in designing circuit breakers	3	3	3	2	1	-	-	-	1	-	-	1	1	1	1
		CO 4	Ability to analyze the state of the power system for various unsymmetrical faults	3	2	2	2	2	-	-	-	1	-	-	1	1	1	2
		CO 5	Ability to analyze the stability of power system using different methods.	3	3	2	2	2	-	-	-	1	-	-	1	1	1	1
		Av g		3	2.6	2.4	1.8	1.4	-	-	-	1	-	-	1	1	1	1.4
21153C52	CONTROL SYSTEMS	CO 1	: Represent simple systems in transfer function and state variable forms	3	3	3	3	3	-	-	1	-	-	-	3	3	3	3
		CO 2	Analyze simple systems in time domain.	3	3	3	3	3	-	-	1	-	-	-	3	3	3	3
		CO 3	Analyze simple systems in frequency domain.	3	3	3	3	3	-	-	1	-	-	-	3	3	3	3
		CO 4	: Infer the stability of systems in time and frequency domain.	3	3	3	3	3	-	-	1	-	-	-	3	3	3	3

		CO 5	Ability to do electric connection for any domestic appliance like refrigerator, batte charging circuit for a specific household application.	1	1	3	-	-	1	-	1.5	-	-	-	-	-	2	
		CO 6	To illustrate the need for energy conservation and to simulate three phase pow control	3	3	3	-	-	-	-	1.5	-	-	-	-	-	3	
		Av g		2.2	2	.6 ²	1	-	1	-	1.5	-	-	-	-	-	2.5	
21153E55 A	SPECIAL ELECTRICAL MACHINES	CO 1	Ability to model and analyze power electronic systems and equipment using computational software.	3	-	-	-	-	-	-	1	-	1	-	1	3	2	1
		CO 2	Ability to optimally design magnetics required in special machines based drive systems using FEM based software tools.	3	3	3	3	-	-	2	1	-	2	-	3	3	3	3
		CO 3	Ability to analyse the dynamic performance of special electrical machines	3	-	-	-	-	-	-	1	-	1	-	1	3	3	3
		CO 4	Ability to understand the operation and characteristics of other special electrical	3	3	3	3	-	-	-	1	-	3	-	3	3	3	3
		CO 5	Ability to design and conduct experiments towards research.	3	3	3	3	-	-	3	1	-	3	-	3	3	3	3
		Av g		3	3	3	3	3	-	2.5	1	-	2.2	-	2.3	3	2.8	2.6
21153E56 D	VLSI DESIGN	CO 1	Develop CMOS design techniques	3	1	1	2	1	-	-	-	-	-	-	-	2	2	3
		CO 2	Learn and build IC fabrication	3	1	2	3	1	-	-	-	-	-	-	-	1	1	3
		CO 3	Explain the need of reconfigurable computing with PLDs	3	2	2	2	3	-	-	-	-	-	-	-	2	1	3
		CO 4	Design and development of reprogrammable FPGA.	3	2	2	2	3	-	-	-	-	-	-	-	2	2	3
		CO 5	Illustrate and develop HDL computational processes with improved design strategies.	3	2	1	3	3	-	-	-	1	-	-	-	2	2	3
		Av g		3	1.6	1.6	2.4	2.2	-	-	-	1	-	-	-	1.8	.6 ¹	3

21147MC 51D	DISASTER MANAGEMENT	1	To impart knowledge on the concepts of Disaster, Vulnerability and Disaster Risk reduction (DRR	3	3	2	3	-	-	2	2	-	-	2	-	2	-	1		
		2	To enhance understanding on Hazards, Vulnerability and Disaster Risk Assessment prevention and risk reduction	3	3	3	3	-	-	2	1	-	-	2	-	2	-	2	-	1
		3	To develop disaster response skills by adopting relevant tools and technology	3	3	3	3	-	-	2	2	-	-	-	-	2	-	2	-	1
		4	Enhance awareness of institutional processes for Disaster response in the country and	3	3	2	3	-	-	2	1	-	-	2	-	2	-	2	-	1
		5	Develop rudimentary ability to respond to their surroundings with potential Disaster response	3	3	2	3	-	-	2	2	-	-	2	-	3	-	3	-	1
		AV G		3	3	3	3	-	-	2	2	-	-	2	-	2	-	2	-	1
21153L57	CONTROL AND INSTRUMENTATI ON LABORATORY	CO 1	To model and analyze simple physical systems and simulate the performance in analog and digital platform.	3	3	3	3	3	-	-	1.5	-	-	-	2	3	3	3		
		CO 2	To design and implement simple controllers in standard forms.	3	3	3	3	3	-	-	1.5	-	-	-	2	3	3	3		
		CO 3	To design compensators based on time and frequency domain specifications.	3	3	3	3	3	-	-	1.5	-	-	-	2	3	3	3		
		CO 4	To design a complete closed control loop and evaluate its performance for simple physical systems.	3	3	3	3	3	-	-	1.5	-	-	-	2	3	3	3		
		CO 5	To analyze the stability of a physical system in both continuous and discrete domains.	3	3	3	3	3	-	-	1.5	-	-	-	2	3	3	3		
		Av g		3	3	3	3	3	-	-	1.5	-	-	-	2	3	3	3		
21153L58		CO 1	Determine the characteristics of SCR, IGBT, TRIAC, MOSFET and IGBT	3	3	3	3	3	-	-	1.5	-	-	-	3	3	3	3		

	POWER ELECTRONICS LABORATORY	CO 2	Find the transfer characteristics of full converter, semi converter, step up and step down choppers by simulation experimentation.	3	3	3	3	3	-	-	1.5	-	-	-	3	3	3	3
		CO 3	Analyze the voltage waveforms for PWM inverter using various modulation techniques	3	3	3	3	3	-	-	1.5	-	-	-	3	3	3	3
		CO 4	Design and experimentally verify the performance of basic DC/DC converter topologies used for SMPS.	3	3	3	3	3	-	-	1.5	-	-	-	3	3	3	3
		CO 5	Understand the performance of AC voltage controllers by simulation and experimentation	3	3	3	3	3	-	-	1.5	-	-	-	3	3	3	3
		Av g		3	3	3	3	3	-	-	1.5	-	-	-	3	3	3	3
21150OE6 1A	IOT CONCEPTS AND APPLICATIONS	CO 1	Explain the concept of IoT.	3	3	3	3	3	-	-	1.5	-	-	-	2	3	3	3
		CO 2	Understand the communication models and various protocols for IoT.	3	3	3	3	3	-	-	1.5	-	-	-	2	3	3	3
		CO 3	Design portable IoT using Arduino/Raspberry Pi /open platform	3	3	3	3	3	-	-	1.5	-	-	-	2	3	3	3
		CO 4	Apply data analytics and use cloud offerings related to IoT	3	3	3	3	3	-	-	1.5	-	-	-	2	3	3	3
		CO 5	Analyze applications of IoT in real time scenario.	3	3	3	3	3	-	-	1.5	-	-	-	2	3	3	3
		Av g		3	3	3	3	3	-	-	1.5	-	-	-	2	3	3	3
21153C62	POWER SYSTEM OPERATION AND CONTROL	CO 1	Understand the day - to - day operation of power system.	2	1	-	-	-	-	-	1	-	-	-	2	3	3	3
		CO 2	Model and analyse the control actions that are implemented to meet the minute-to-minute variation of system real power demand.	3	2	1	1	-	1	-	2	-	2	-	2	3	3	3

		CO 3	Model and analyze the compensators for reactive power control and various devices used for voltage control.	3	2	1	1	-	1	-	2	-	2	-	2	3	3	3	
		CO 4	Prepare day ahead and real time economic generation scheduling.	3	2	1	1	-	1	-	2	-	2	-	2	3	1	2.33	
		CO 5	Understand the necessity of computer control of power systems	2	1	-	-	-	-	-	1	-	2	-	2	3	3	3	
		Av g.		2	1.6	1	1	-	1	-	1.6	-	2	-	2	3	2.2	2.86	
21153C6 3	PROTECTION AND SWITCHGEAR	CO 1	Understand and select proper protective scheme and type of earthing.	3	1	1	2	1	2	1	1	1	1	2	-	3	1	-	
		CO 2	Explain the operating principles of various relays.	3	1	1	2	1	2	1	1	1	1	1	2	-	3	1	-
		CO 3	Suggest suitable protective scheme for the protection of various power system apparatus.	3	1	1	2	1	2	1	1	1	1	1	2	-	3	2	-
		CO 4	Analyze the importance of static relays and numerical relays in power system protection.	3	1	1	2	1	2	1	1	1	1	1	2	-	3	2	1
		CO 5	Summarize the merits and demerits and application areas of various circuit breakers.	3	1	1	2	2	2	1	1	1	1	1	2	-	3	1	1
		Av g.		3	1	1	2	1.2	2	1	1	1	1	1	2	-	3	1.4	1
21153E64 B	POWER QUALITY	CO 1	Use various definitions of power quality for power quality issues	3	3	3	3	-	-	3	3	-	3	-	3	3	3	3	
		CO 2	Describe the concepts related with single phase / three phase, linear / nonlinear loads and single phase / three phase sinusoidal, non-sinusoidal source	3	3	3	3	-	-	3	3	-	3	-	3	3	3	3	3
		CO 3	Solve problems related with mitigation of Power System Harmonics	3	3	3	3	-	-	3	3	-	3	-	3	3	3	3	3
		CO 4	Use DSTATCOM for load compensation	3	3	3	3	-	-	3	3	-	3	-	3	3	3	3	3

		CO 5	Demonstrate the role of DVR, SAFs UPQC in power distribution systems	3	3	3	3	-	-	3	3	-	3	-	3	3	3	3	
		Avg		3	3	3	3	-	-	3	3	-	3	-	3	3	3	3	
21153E65 A	HVDC AND FACTS	CO 1	To Identify and understand the problems in AC transmission systems and understand the need for Flexible AC transmission systems and HVDC Transmission	3	3	1	3	1	-	-	-	-	-	-	-	2	3	3	
		CO 2	To understand the operation and control of SVC and TCSC and its applications to enhance the stability and damping	2	3	1	2	3	-	-	-	-	-	-	-	-	2	3	3
		CO 3	To Analyze basic operation and control of voltage source converter based FACTS controllers	2	3	1	3	1	-	-	-	-	-	-	-	-	2	3	3
		CO 4	To demonstrate basic operation and control of Line Commutated HVDC Transmission	3	3	1	2	3	-	-	-	-	-	-	-	-	2	3	3
		CO 5	To explain the d-q control based operation of VSC based HVDC Transmission	3	3	1	3	1	-	-	-	-	-	-	-	-	2	3	3
		Avg		2.6	3	1	2.6	1.8	-	-	-	-	-	-	-	-	2	3	3
21153E66 E	HYBRID ENERGY TECHNOLOGY	CO 1	Analyze the impacts of hybrid energy technologies on the environment and demonstrate them to harness electrical power.	3	3	3	2	-	-	-	-	-	3	-	3	3	3	3	
		CO 2	Select a suitable Electrical machine for Wind Energy Conversion Systems and simulate wind energy conversion system	3	3	3	2	3	-	-	-	-	3	-	3	3	3	3	3
		CO 3	Design the power converters such as AC-DC, DC-DC, and AC-AC converters for SPV systems	3	3	3	2	3	-	-	-	-	3	-	3	3	3	3	3
		CO 4	Analyze the power converters such as AC-DC, DC-DC, and AC-AC converters for Hybrid energy systems	3	3	3	2	3	-	-	-	-	3	-	3	3	3	3	3

		CO 5	Interpret the hybrid renewable energy systems	3	3	3	2		-	-	-	-	3	-	3	3	3	3
		Av g		3	3	3	2	3	-	-	-	-	3	-	3	3	3	3
21153L67	POWER SYSTEM LABORATORY	CO 1	Model and analyze the performance of the transmission lines.	3	3	2	2	3	-	-	2	1	2	-	3	3	3	3
		CO 2	Perform power flow, short circuit, and stability analysis for any power system network	3	3	2	2	3	-	-	2	1	2	-	3	3	3	3
		CO 3	Understand, design, and analyze the load frequency control mechanism.	3	3	2	2	3	-	-	2	1	2	-	3	3	3	3
		CO 4	Perform optimal scheduling of generators and compute the state of the power system	3	3	2	2	3	-	-	2	1	2	-	3	3	3	3
		CO 5	Understand, analyze, and apply the relays for power system protection.	3	3	2	2	3	-	-	2	1	2	-	3	3	3	3
		Av g		3	3	2	2	3	-	-	2	1	2	-	3	3	3	3
21147S71	HUMAN VALUES AND ETHICS	CO 1	Identify the importance of democratic, secular and scientific values in harmonious functioning of social life	3	3	1	3	1	-	-	-	-	-	-	-	2	3	3
		CO 2	Practice democratic and scientific values in both their personal and professional life.	2	3	1	2	3	-	-	-	-	-	-	-	2	3	3
		CO 3	Find rational solutions to social problems.	2	3	1	3	1	-	-	-	-	-	-	-	2	3	3
		CO 4	Behave in an ethical manner in society	3	3	1	2	3	-	-	-	-	-	-	-	2	3	3
		CO 5	Practice critical thinking and the pursuit of truth.	3	3	1	3	1	-	-	-	-	-	-	-	2	3	3
		Av g		2.6	3	1	2.6	1.8	-	-	-	-	-	-	-	2	3	3
21153C77	HIGH VOLTAGE ENGINEERING	CO 1	Explain various overvoltage's and its effects on power systems	2	2	-	-	-	-	-	-	-	-	-	3	2	-	

		CO 2	Understand the breakdown phenomena in different medium under uniform and non-uniform fields	3	2	-	1	-	-	-	-	-	-	-	-	3		-	
		CO 3	Explain the methods of generating	2	2	3	1	-	-	-	-	-	2	3	3	2		-	
		CO 4	Suggest and Conduct suitable HV testing of Electrical power apparatus as per Standards	1	2	3	1	-	-	-	1	1	-		3	3	2	-	
		CO 5	Explain the Industrial Applications of Electrostatic Fields.	2	2	1	-	-	2	-	-	-	2	-	3			2	
		Av g.		2	2	2.3 3	1	-	2	-	1	1	-	2	3	3	2	2	
21150OE7 4B	DATA SCIENCE FUNDAMENTALS	CO 1	Gain knowledge on data science process	3	3	1	3	1	-	-	-	-	-	-	-	2	3	3	
		CO 2	Perform data manipulation functions using Numpy and Pandas	2	3	1	2	3	-	-	-	-	-	-	-	-	2	3	3
		CO 3	Understand different types of machine learning approaches	2	3	1	3	1	-	-	-	-	-	-	-	-	2	3	3
		CO 4	Perform data visualization using tools.	3	3	1	2	3	-	-	-	-	-	-	-	-	2	3	3
		CO 5	Handle large volumes of data in practical scenarios.	3	3	1	3	1	-	-	-	-	-	-	-	-	2	3	3
		Av g.		2.6	3	1	2.6	1.8	-	-	-	-	-	-	-	-	2	3	3
21147OE7 3A	ENGLISH FOR COMPETITIVE EXAMINATIONS	CO 1	Expand their vocabulary and gain practical techniques to read and comprehend a wide range of texts with the emphasis required	3	3	1	3	1	-	-	-	-	-	-	-	2	3	3	
		CO 2	identify errors with precision and write with clarity and coherence	2	3	1	2	3	-	-	-	-	-	-	-	-	2	3	3
		CO 3	understand the importance of task fulfilment and the usage of task-appropriate vocabulary	2	3	1	3	1	-	-	-	-	-	-	-	-	2	3	3
		CO 4	communicate effectively in group discussions, presentations and interviews	3	3	1	2	3	-	-	-	-	-	-	-	-	2	3	3

		CO 5	write topic based essays with precision and accuracy	3	3	1	3	1	-	-	-	-	-	-	-	2	3	3	
		Av g.		2.6	3	1	2.6	1.8	-	-	-	-	-	-	-	2	3	3	
21155OE7 4A	GEOGRAPHICAL INFORMATION SYSTEM		Have basic idea about the fundamentals of GIS.	3	-	-	-	3	-	-	-	-	-	-	-	-	-	-	
			Understand the types of data models.	3		3	3	-	-	-	-	-	-	-	-	-	-	-	-
			Get knowledge about data input and topology	3	3	3	3	3	-	-	-	-	-	-	-	-	-	-	-
			Gain knowledge on data quality and standards	3	3	3	3	3	-	-	-	-	-	-	-	-	-	-	-
			Understand data management functions and data output	3	3	3	3	3	-	-	-	-	-	-	-	-	-	-	-
21160S75F	PRINCIPLES OF MANAGEMENT	1	Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling.	3		-	-	-	1	-	-	-	-	-	-	2	1	1	
		2	Have same basic knowledge on international aspect of management	-	1	1	-	-	-	-	-	-	-	-	-	2	1	-	
		3	Ability to understand management concept of organizing.	1		-	2	-	-	1	-	2	-	1	1	-	-	2	
		4	Ability to understand management concept of directing.	-	1	1	1	2	-	-	1	2	-	-	-	1	1	1	
		5	Ability to understand management concept of controlling	1		-	-	1	1	-	-	-	3	-	1	1	-	1	
		AV g.		1.6 6	1	1	1.5	1.5	1	1	1	2	3	1	1	1.5	1	1.25	
21153E76 B	MULTILEVEL POWER CONVERTERS	CO 1	Examine the different topologies of multilevel inverters (MLIs) with and without DC link capacitor.	3	2	2	3	-	-	2	1	-	3	-	3	3	3		
		CO 2	Examine the performance of MLIs with Bipolar Pulse Width Modulation (PWM) Unipolar PWM Carrier-Based PWM Schemes Phase Level Shifted Multicarrier Modulation	3	2	2	3	-	-	2	1	-	3	-	3	3	3		

		CO 3	Demonstrate the working principles of Cascaded H-Bridge MLI, diode clamped MLI, flying capacitor MLI and MLI with reduced switch count	3	2	2	3	-	-	2	1	-	3	-	3	3	3	3	
		CO 4	Analyze the voltage balancing performance in Diode clamped MLI	3	3	3	3	-	-	2	1	-	3	-	3	3	3	3	
		CO 5	Simulate three level, capacitor clamped and diode clamped MLI with R and RL load.	3	3	3	3	3	-	2	1	-	3	-	3	3	3	3	
		CO 6	Simulate MLI with reduced switch configuration using fundamental switching scheme	3	3	3	3	3	-	2	1	-	3	-	3	3	3	3	
		Av g		3	2.5	2.5	3	3	-	2	1	-	3	-	3	3	3	3	
21153P81	PROJECT WORK / INTERNSHIP	CO 1	Ability to identify, formulate, design, interpret, analyze and provide solutions to complex engineering and societal issues by applying knowledge gained on basics of science and Engineering	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	
		CO 2	Ability to choose, conduct and demonstrate a sound technical knowledge of their selected project topics in the field of power components, protection, high voltage, electronics, process automation, power electronics and drives instrumentation and control by exploring suitable engineering and IT tools	-	-	-	-	3	3	-	-	-	-	-	-	-	3	-	-
		CO 3	Ability to understand, formulate and propose new learning algorithms to solve engineering and societal problems of moderate complexity through multidisciplinary projects understanding commitment towards sustainable development	-	-	-	-	-	-	3	-	3	-	-	-	-	-	-	3

