DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING Course outcomes

SEMESTER - 1 & 2

Course code	Course Name		Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
		CO 1	solve systems of linear equations, diagonalize matrices and characterise quadratic forms	3	3	3	3	2	1			1	2		2
		CO 2	compute the partial and total derivatives and maxima and minima of multivariable functions	3	3	3	3	2	1			1	2		2
MAT 101	LINEAR ALGEBRA AND CALCULUS	CO 3	compute multiple integrals and apply them to find areas and volumes of geometrical shapes, mass and centre of gravity of plane laminas	3	3	3	3	2	1			1	2		2
		CO 4	perform various tests to determine whether a given series is convergent, absolutely convergent or conditionally convergent	3	2	3	2	1	1			1	2		2
		CO 5	determine the Taylor and Fourier series expansion of functions and learn their applications.	3	3	3	3	2	1			1	2		2
		CO 1	Compute the quantitative aspects of waves and oscillations in engineering systems.	3	2						1	2			1
		CO 2	Apply the interaction of light with matter through interference, diffraction and identify these phenomena in different natural optical processes and optical instruments.	3	2						1	2			1
PHT 110	ENGINEERING PHYSICS A (FOR CIRCUIT BRANCHES)		Analyze the behaviour of matter in the atomic and subatomic level through the principles of quantum mechanics to perceive the microscopic processes in electronic devices.	3	2						1	2			1
			Classify the properties of magnetic materials and apply vector calculus to static magnetic fields and use Maxwell's equations to diverse engineering problems	3	2						1	2			1
		CO 5	Analyze the principles behind various superconducting applications, explain the working of solid state lighting devices and fibre optic communication system	3	1						1	2			1

		CO 1	Apply the basic concepts of electrochemistry and corrosion to explore its possible applications in various engineering fields.	1	2	1						
		CO 2	Understand various spectroscopic techniques like UV-Visible, IR, NMR and its applications.	1	1		1	2				
CYT 100	ENGINEERING CHEMISTRY		Apply the knowledge of analytical method for characterizing a chemical mixture or a compound. Understand the basic concept of SEM for surface characterisation of nanomaterials.	1	1		1	2				
		CO 4	Learn about the basics of stereochemistry and its application. Apply the knowledge of conducting polymers and advanced polymers in engineering.	2	1							
		CO 5	Study various types of water treatment methods to develop skills for treating wastewater.	1			1		3			
		CO 1	Recall principles and theorems related to rigid body mechanics	2	2							
		CO 2	Identify and describe the components of system of forces acting on the rigid body	3	3							
EST 100	ENGINEERING MECHANICS	CO 3	Apply the conditions of equilibrium to various practical problems involving different force system	3	3							
		CO 4	Choose appropriate theorems, principles or formulae to solve problems of mechanics	3	3							
		CO 5	Solve problems involving rigid bodies, applying the properties of distributed areas and masses	3	3							

		CO 1	Draw the projection of points and lines located in different quadrants	3									
		CO 2	Prepare multiview orthographic projections of objects by visualizing them in different positions	3									
EST 110	ENGINEERING	CO 3	Draw sectional views and develop surfaces of a given object	3	1								
ES1 110	GRAPHICS	CO 4	Prepare pictorial drawings using the principles of isometric and perspective projections to visualize objects in three dimensions.	3								1	
		CO 5	Convert 3D views to orthographic views	3								2	
		CO 6	Obtain multiview projections and solid models of objects using CAD tools	3			3					3	
		CO 1	Recall the role of civil engineer in society and to relate the various disciplines of Civil Engineering.	3				3	2	2			
		CO 2	Explain different types of buildings, building components, building materials and building construction	3	2					3			
		CO 3	Describe the importance, objectives and principles of surveying.	3	2			2	3		2		
		CO 4	Summarise the basic infrastructure services MEP, HVAC, elevators, escalators and ramps	3	2	1	3				2		
		CO 5	Discuss the Materials, energy systems, water management and environment for green buildings.	3	2		3				2		
EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING	CO 6	Analyse thermodynamic cycles and calculate its efficiency	3	2		3						
		CO 7	Illustrate the working and features of IC Engines	3	1		3						
		CO 8	Explain the basic principles of Refrigeration and Air Conditioning	3	1								
		CO 9	Describe the working of hydraulic machines	3	2								

		CO 10	Explain the working of power transmission elements	3	1								
		CO 11	Describe the basic manufacturing, metal joining and machining processes	3									
		CO 1	Apply fundamental concepts and circuit laws to solve simple DC electric circuits	3	1								2
		CO 2	Develop and solve models of magnetic circuits	3	1								2
EST	BASICS OF ELECTRICAL AND	CO 3	Apply the fundamental laws of electrical engineering to solve simple ac circuits in steady state	3	1								2
130	ELECTRONICS ENGINEERING	CO 4	Describe working of a voltage amplifier	2									
		CO 5	Outline the principle of an electronic instrumentation system	2									2
		CO 6	Explain the principle of radio and cellular communication	2									2
		CO 1	Define and Identify different life skills required in personal and professional life					2	1	2	2	1	3
		CO 2	Develop an awareness of the self and apply well-defined techniques to cope with emotions and stress.							3			2
HUN 101	LIFE SKILLS	CO 3	Explain the basic mechanics of effective communication and demonstrate these through presentations.					1		1	3		
101		CO 4	Take part in group discussions								3		1
		CO 5	Use appropriate thinking and problem solving techniques to solve new problems		3	2	1						
		CO 6	Understand the basics of teamwork and leadership					1		3			

		CO 1	Compute the derivatives and line integrals of vector functions and learn their applications	3	3	3	3	2	1		1	2	2
		CO 2	Evaluate surface and volume integrals and learn their inter-relations and applications	3	3	3	3	2	1		1	2	2
MAT 102	VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS	CO 3	Solve homogeneous and non-homogeneous linear differential equation with constant coefficients	3	3	3	3	2	1		1	2	2
		CO 4	Compute Laplace transform and apply them to solve ODEs arising in engineering	3	3	3	3	2	1		1	2	2
		CO 5	Determine the Fourier transforms of functions and apply them to solve problems arising in engineering	3	3	3	3	2	1		1	2	2
		CO 1	Develop vocabulary and language skills relevant to engineering as a profession	3				3		1	2		1
		CO 2	Analyze, interpret and effectively summarize a variety of textual content	3				3		1	2		1
HUN	PROFESSIONAL	CO 3	Create effective technical presentations	3				3		1	2		1
102	COMMUNICATION	CO 4	Discuss a given technical/non-technical topic in a group setting and arrive at generalizations/consensus	3				3		1	2		1
		CO 5	Identify drawbacks in listening patterns and apply listening techniques for specific needs	3				3		1	2		1
		CO 6	Create professional and technical documents that are clear and adhering to all the necessary conventions	3				2					3
		CO 1	Analyze a computational problem and develop an algorithm/flowchart to find its solution	3				3					3
		CO 2	Develop readable* C programs with branching and looping statements, which uses Arithmetic, Logical, Relational or Bitwise operators.	3				3					3
EST 102	PROGRAMING IN C	CO 3	Write readable C programs with arrays, structure or union for storing the data to be processed	3				3					3
102	1 ROGRESSIESO ES C	CO 4	Divide a given computational problem into a number of modules and develop a readable multi-function C program by using recursion if required, to find the solution to the computational problem	3				1					3

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		CO 5	Write readable C programs which use pointers for array processing and parameter passing	3			1						3
		CO 6	Develop readable C programs with files for reading input and storing output	*	*	*					*		*
		CO 1	Develop analytical/experimental skills and impart prerequisite hands on experience for engineering laboratories	3			3		1	2			1
		CO 2	Understand the need for precise measurement practices for data recording	3			3		1	2			1
PHL 120	ENGINEERING PHYSICS LAB	СОЗ	Understand the principle, concept, working and applications of relevant technologies and comparison of results with theoretical calculations	3			3		1	2			1
		CO 4	Analyze the techniques and skills associated with modern scientific tools such as lasers and fiber optics	3			3		1	2			1
		CO 5	Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results	3			3		1	2			1
		CO 1	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various analyses	3			2						3
		CO 2	Develop skills relevant to synthesize organic polymers and acquire the practical skill to use TLC for the identification of drugs	3			3						3
CYL	ENGINEERING	CO 3	Develop the ability to understand and explain the use of modern spectroscopic techniques for analysing and interpreting the IR spectra and NMR spectra of some organic compounds	3			3						3
120	CHEMISTRY LAB	CO 4	Acquire the ability to understand, explain and use instrumental techniques for chemical analysis	3			3						3
		CO 5	Learn to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments	3			1						3
		CO 6	Function as a member of a team, communicate effectively and engage in further learning. Also understand how chemistry addresses social, economical and environmental problems and why it is an integral part of curriculum	3			1						3

		CO 1	Name different devices and tools used for civil engineering measurements	1			1	1		2	2		
		CO 2	Explain the use of various tools and devices for various field measurements	1			1	1		2	2		
		CO 3	Demonstrate the steps involved in basic civil engineering activities like plot measurement, setting out operation, evaluating the natural profile of land, plumbing and undertaking simple construction work	1			1	1	2	2	2	1	
ESL 120	CIVIL & MECHANICAL	CO 4	Choose materials and methods required for basic civil engineering activities like field measurements, masonry work and plumbing.	1			1	1	2	2	2	1	1
ESL 120	WORKSHOP	CO 5	Compare different techniques and devices used in civil engineering measurements	1			1	1		2	2		1
		CO 6	Identify Basic Mechanical workshop operations in accordance with the material and objects	1									
		CO 7	Apply appropriate Tools and Instruments with respect to the mechanical workshop trades	2									
		CO 8	Apply appropriate safety measures with respect to the mechanical workshop trades	2									
		CO 1	Demonstrate safety measures against electric shocks					3					1
		CO 2	Identify the tools used for electrical wiring, electrical accessories, wires, cables, batteries and standard symbols	2							1		
		CO 3	Develop the connection diagram, identify the suitable accessories and materials necessary for wiring simple lighting circuits for domestic buildings	2		1		1	1	2	2		2
ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	CO 4	Identify and test various electronic components	3									2
		CO 5	Draw circuit schematics with EDA tools	3			2						2
		CO 6	Assemble and test electronic circuits on boards	3			2						1
		CO 7	Work in a team with good interpersonal skills							3	2		2

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		CO 1	Understand the concept and the solution of partial differential equation.	3	3	3	3	2	1				2		2
		CO 2	Analyse and solve one dimensional wave equation and heat equation.	3	3	3	3	2	1				2		2
MAT201	PARTIAL DIFFERENTIAL EQUATIONS AND COMPLEX ANALYSIS	CO 3	Understand complex functions, its continuity differentiability with the use of CauchyRiemann equations.	3	3	3	3	2	1				2		2
	11.1210.0	CO 4	Evaluate complex integrals using Cauchy's integral theorem and Cauchy's integral formula, understand the series expansion of analytic function	3	3	3	3	2	1				2		2
		CO 5	Understand the series expansion of complex function about a singularity and Apply residue theorem to compute several kinds of real integrals.	3	3	3	3	2	1				2		2
		CO 1	Apply circuit theorems to simplify and solve complex DC and AC electric networks.	3	3										2
		CO 2	Analyse dynamic DC and AC circuits and develop the complete response to excitations.	3	3										2
EET201	CIRCUITS AND	CO 3	Solve dynamic circuits by applying transformation to s-domain.	3	3										2
EE1201	NETWORKS	CO 4	Analyse three-phase networks in Y and Δ configurations.	3	3										2
		CO 5	Solve series /parallel resonant circuits.	3	3										2
		CO 6	Develop the representation of two-port networks using network parameters and analyse.	3	3										2

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		CO 1	Identify and analysethe factors affecting performance of measuring system	2	1							
		CO 2	Choose appropriate instruments for the measurement of voltage, current in ac and dc measurements	3	1							
EET203	MEASUREMENTS AND	CO 3	Explain the operating principle of power and energy measurement	3	1							
EET203	INSTRUMENTATION	CO 4	Outline the principles of operation of Magnetic measurement systems	3								
		CO 5	Describe the operating principle of DC and AC bridges, transducersbased systems.	3				1				2
		CO 6	Understand the operating principles of basic building blocks of digital systems, recording and display units	3				2				2
		CO 1	Design biasing scheme for transistor circuits.	2	2	2						
		CO 2	Model BJT and FET amplifier circuits.	2	2	2						
EET 205	ANALOG ELECTRONICS	CO 3	Identify a power amplifier with appropriate specifications for electronic circuit applications.			1	2					
EE1 203	ANALOG ELLETRONICS	CO 4	Describe the operation of oscillator circuits using BJT.	2	2	2						
		CO 5	Explain the basic concepts of Operational amplifier(OPAMP)			1	2					
		CO 6	Design and develop various OPAMP application circuits.	2	2	2						ı

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		CO 1	Explain the different concepts and principles involved in design engineering.	2	1				1			1	
EST 200	DESIGN AND ENGINEERING	CO 2	Apply design thinking while learning and practicing engineering.		2			1		1			2
		СОЗ	Develop innovative, reliable, sustainable and economically viable designs incorporating knowledge in engineering.			2		1	1		2	2	1
		CO 1	Understand the relevance and the concept of sustainability and the global initiatives in this direction					2	3				2
		CO 2	Explain the different types of environmental pollution problems and their sustainable solutions					2	3				2
MCN201	SUSTAINABLE ENGINEERING	CO 3	Discuss the environmental regulations and standards					2	3				2
		CO 4	Outline the concepts related to conventional and non-conventional energy					2	3				2
		CO 5	Demonstrate the broad perspective of sustainable practices by utilizing engineering knowledge and principles					2	3				2
		CO 1	Use the various electronic instruments and for conducting experiments.	2							2		
		CO 2	Design and develop various electronic circuits using diodes and Zener diodes.	2	2	2					2		
EEL203	ANALOG	CO 3	Design and implement amplifier and oscillator circuits using BJT and JFET.	2	2	2					2		
EEL2U3	ELECTRONICSLAB	CO 4	Design and implement basic circuits using IC (OPAMP and 555 timers).	2	2	2					2		

		CO 5	Simulate electronic circuits using any circuit simulation software.	1	1			3		3			
		CO 6	Use PCB layout software for circuit design	1				3		3			
		CO 1	Analyse voltage current relations of RLC circuits	3	3	2				2			3
		CO 2	Verify DC network theorems by setting up various electric circuits	3	3					2			3
		СОЗ	Measure power in a single and three phase circuits by various methods	3	3					2			3
EEL201	CIRCUITS AND	CO 4	Calibrate various meters used in electrical systems	3	3	2				2			3
EEL201	MEASUREMENTS LAB	CO 5	Determine magnetic characteristics of different electrical devices	3	3					2			3
		CO 6	Analyse the characteristics of various types of transducer systems	3	3	2				2			3
		CO 7	Determine electrical parameters using various bridges	3	3					2			3
		CO 8	Analyse the performance of various electronic devices for an instrumentation systems and, to develop the team management and documentation capabilities.	3	3	3	3	2		2	3	3	3

Course code	Course Name		Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
		CO 1	Understand the concept, properties and important models of discrete random variables and,using them, analyse suitable random phenomena.	3	2	2	2	2					2		1
		CO 2	Understand the concept, properties and important models of continuous random variables and,using them, analyse suitable random phenomena	3	2	2	2	2					2		1
MAT 202	PROBABILITY,STATISTIC S AND NUMERICAL METHODS	CO 3	Perform statistical inferences concerning characteristics of a population based on attributes of samples drawn from the population	3	2	2	2	2					2		1
		CO 4	Compute roots of equations, evaluate definite integrals and perform interpolation on given numerical data using standard numerical techniques	3	2	2	2	2					2		1
		CO 5	Apply standard numerical techniques for solving systems of equations, fitting curves on given numerical data and solving ordinary differential equations.	3	2	2	2	2					2		1
		CO 1	Acquire knowledge about constructional details of DC machines	3	2			2							3
		CO 2	Describe the performance characteristics of DC generators	3	2	2			2						3
EET202	DC MACHINES AND		Describe the principle of operation of DC motors and select appropriate motor types for different applications	3	2				2						3
EE 1202	TRANSFORMERS	CO 4	Acquire knowledge in testing of DC machines to assess its performance Describe the constructional details and modes of operation of single phase and three phase transformers	3	3				2						3
		CO 5	Describe the constructional details and modes of operation of single phase and three phase transformers	3					2						3
		CO 6	Analyse the performance of transformers under various conditions	3					2						3

		CO 1	Apply vector analysis and coordinate systems to solve static electric and magnetic field problems.	2	3							
		CO 2	Apply Gauss Law, Coulomb's law and Poisson's equation to determine electrostatic field parameters	2	3							
EET 204	ELECTROMAGNETIC THEORY	CO 3	Determine magnetic fields from current distributions by applying Biot-Savart's law and Amperes Circuital law.	2	3							
		CO 4	Apply Maxwell Equations for the solution of timevarying fields	2	3							
		CO 5	Analyse electromagnetic wave propagation in different media.	2	3							
		CO 1	Identify various number systems, binary codes and formulate digital functions using Boolean algebra.	3	1							
		CO 2	Design and implement combinational logiccircuits.	3	3	2						
EET 206	DIGITAL ELECTRONICS	CO 3	Design and implement sequential logic circuits.	3	3	2						
		CO 4	Compare the operation of various analog to digital and digital to analog conversion circuits.	3	2	1						
		CO 5	Explain the basic concepts of programmable logic devices and VHDL.	3	2	2	2					
		CO 1	Understand the core values that shape the ethical behaviour of a professional.						2		2	
		CO 2	Adopt a good character and follow an ethical life.						2		2	
HUT 200	Professional Ethics	CO 3	Explain the role and responsibility in technological development by keeping personal ethics and legal ethics.						3		2	
		CO 4	Solve moral and ethical problems through exploration and assessment by established experiments.						3		2	
		CO 5	Apply the knowledge of human values and social values to contemporary ethical values and global issues.						3		2	

		CO 1	Explain the background of the present constitution of India and features					2	2	2		2	
		CO 2	Utilize the fundamental rights and duties.					3	3	3		3	
MCN202	CONSTITUTION OF INDIA	CO 3	Understand the working of the union executive, parliament and judiciary.					3	2	3		3	
WICH202	CONSTITUTION OF INDIA	CO 4	Understand the working of the state executive, legislature and judiciary.					3	2	3		3	
		CO 5	Utilize the special provisions and statutory institutions.					3	2	3		3	
		CO 6	Show national and patriotic spirit as responsible citizens of the country					3	3	3		2	
		CO 1	Analyse the performance of DC motors and DC generators by performing load test.	3	3	2	2				3	2	3
		CO 2	Sketch the Open Circuit Characteristics of a self excited DC shunt generator and check conditions of voltage build up by performing suitable experiment.	3	3	2	2				3	2	3
EEL202	ELECTRICAL MACHINES	CO 3	Develop equivalent circuit and predetermine their regulation and efficiency by performing OC & SC tests on transformer.	3	3	2	2				3	2	3
EED202	LAB I	CO 4	Analyse the efficiency and regulation of the transformer by performing load test	3	3	2	2				3	2	3
		CO 5	Analyse the efficiency of a DC machine when working as motor and generator by conducting suitable test.	3	3	2	2				3	2	3
		CO 6	Examine the efficiency by performing Sumpner's test on two similar transformers.	3	3	2	2				3	2	3

		CO 1	Formulate digital functionsusing Boolean Algebra and verify experimentally.	3	1	1	3	3		2	3	3		1
EEL 204	DIGITAL ELECTRONICS	CO 2	Design and implement combinational logic circuits.	3	3	3	3	3		2	3	3		1
EEL 204	LAB	CO 3	Design and implement sequential logic circuits.	3	3	3	3	3		2	3	3		1
		(()4	Design and fabricate a digital circuit using the knowledge acquired from the laboratory.	3	2	1	3	2		2	3	3	2	3

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		CO 1	Identify the power generating system appropriate for a given area.	3					2						
		CO 2	Evaluate the electrical performance of any transmission line.	3	3										
EET301	POWER SYSTEMS I	CO 3	Compute various physical characteristics of underground and overhead transmission systems.	3	2				2	2	2				
		CO 4	Select appropriate switchgear for protection schemes.	3	1				2		2				1
		CO 5	Design a simple electrical distribution system as per the standards.	3	1				2	2	2			1	2
		CO 1	Describe the architecture and timing diagram of 8085 microprocessor.	3	2										
		CO 2	Develop assembly language programs in 8085 microprocessor.	3	2	3	2	1							
EET303	MICROPROCESSORS AND MICROCONTROLLERS	CO 3	Identify the different ways of interfacing memory and I/O with 8085 microprocessor.	3	2	2	2	2							
		CO 4	Understand the architecture of 8051 microcontroller and embedded systems.	3	2										

	CO 5	Develop assembly level and embedded C programs in 8051 microcontroller.	3	2	3	2	1	1						1
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		CO 1	Explain the basic operations on signals and systems.	3	3		2					1
		CO 2	Apply Fourier Series and Fourier Transform concepts for continuous time signals.	3	3	3						1
EET305	SIGNALS AND SYSTEMS	CO 3	Analyse the continuous time systems with Laplace Transform.	3	3	3	2					2
EE1303	SIGNALS AND SYSTEMS	CO 4	Analyse the discrete time system using Z Transform.	3	3	3	2					2
		CO 5	Apply Fourier Series and Fourier Transform concepts for Discrete time domain.	3	3	3						2
		CO 6	Describe the concept of stability of continuous time systems and sampled data systems.	3	3		2					1
		CO 1	Analyse the performance of different types of alternators.	2	2			2				2
		CO 2	Analyse the performance of a synchronous motor.	3	3	2		2				2
EET 307	SYNCHRONOUS AND INDUCTION MACHINES	CO 3	Analyse the performance of different types of induction motors.	3	3	2		2				2
		CO 4	Describe operating principle of induction machine as generator.	3	3	2		2				2
		CO 5	Explain the types of single phase induction motors and their working principle.	2	2			2				2
		CO 1	Define and use various terminologies in use in disaster management parlance and organise each of these terms in relation to the disaster management cycle		2			2				
		CO 2	Distinguish between different hazard types and vulnerability types and do vulnerability assessment	2	3	2	2	2	3		2	2

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MCN 301	DISASTER	CO 3	Identify the components and describe the process of risk assessment, and apply appropriate methodologies to assess risk	2	3	2	2	2	2	3			3		2
WCN 301	MANAGEMENT		Explain the core elements and phases of Disaster Risk Management and develop possible measures to reduce disaster risks across sector and community	3	3	3		2	2	3			3		2
		CO 5	Identify factors that determine the nature of disaster response and discuss the various disaster response actions	3	3			2	2	3					2
		CO 6	Explain the various legislations and best practices for disaster management and risk reduction at national and international level	3					2	3	3				2
		CO 1	Develop and execute assembly language programs for solving arithmetic and logical problems using microprocessor/microcontroller.	3	3	2	2	3			2	2	3		2
EEL331	MICROPROCESSORS AND MICROCONTROLLERS LAB	CO 2	Design and Implement systems with interfacing circuits for various applications.	3	3	2	2	3			2	2	3		2
		CO 3	Execute projects as a team using microprocessor/microcontroller for real life applications.	3	3	3	3	3	3	3	3	3	3	2	2
		CO 1	Analyse the performance of single phase and three phase induction motors by conducting suitable tests.	3	3	2	2					3	2		3
EEL333	ELECTRICAL MACHINES LAB II	CO 2	Analyse the performance of three phase synchronous machine from V and inverted V curves.	3	3	2	2					3	2		3
		CO 3	Analyse the performance of a three phase alternator by conducting suitable tests.	3	3	2	2					3	2		3

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			Describe the role of various control blocks and components in feedback systems.	3	3										1
		CO 2	Analyse the time domain responses of the linear systems.	3	3	3									2
EET302	LINEAR CONTROL	CO 3	Apply Root locus technique to assess the performance of linear systems.	3	3	3		2							2
EE1302	SYSTEMS	CO 4	Analyse the stability of the given LTI systems.	3	3	3									3
		CO 5	Analyse the frequency domain response of the given LTI systems.	3	3	3		2							3
		CO 6	Design compensators using time domain and frequency domain techniques.	3	3	3	2								3
		CO 1	Apply the per unit scheme for any power system network and compute the fault levels.	3	3										2
			Analyse the voltage profile of any given power system network using iterative methods.	3	3	2									2
EET304	POWER SYSTEMS II	CO 3	Analysethe steady state and transient stability of power system networks.	3	3	2									1
		CO 4	Model the control scheme of power systems.	3	2										
		CO 5	Schedule optimal generation scheme.	3	3	1								3	1

		CO 1	Explain the operation of modern power semiconductor devices and its characteristics.	3	1		1							
		CO 2	Analyse the working of controlled rectifiers.	3	2	1	2							2
EET 306	POWER ELECTRONICS	CO 3	Explain the working of AC voltage controllers, inverters and PWM techniques.	3	3									
		CO 4	Compare the performance of different dc-dc converters.	3	3	2	2							2
		CO 5	Describe basic drive schemes for ac and dc motors.	3	2									2
		CO 1	Apply the knowledge of circuit theorems to solve the problems in electrical networks	3	3									
		CO 2	Evaluate the performance of DC machines and Transformers under different loading conditions	3	2									2
EET308	COMPREHENSIVE COURSE WORK	CO 3	Identify appropriate digital components to realise any combinational or sequential logic.	3	3	1		1						2
		CO 4	Apply the knowledge of Power generation, transmission and distribution to select appropriate components for power system operation	3	3				1	1	1		1	2
		CO 5	Apply appropriate mathematical concepts to analyse continuous time and discrete time signals and systems	3	3	1		1						2

		CO 1	Explain the problem of scarcity of resources and consumer behaviour, and to evaluate the impact of government policies on the general economic welfare	2										3	
		CO 2	Take appropriate decisions regarding volume of output and to evaluate the social cost of production.	2	2			2	2	3				3	
HUT 300	Industrial Economics & Foreign Trade	CO 3	Determine the functional requirement of a firm under various competitive conditions.	2	2	1								3	
		CO 4	Examine the overall performance of the economy, and the regulation of economic fluctuations and its impact on various sections in the society.	2	2	1			1					3	
		CO 5	Determine the impact of changes in global economic policies on the business opportunities of a firm	2	2	1								3	
		CO 1	Describe the environmental aspects of renewable energy resources.	3	3										2
EET 322	RENEWABLE ENERGY	CO 2	Explain the operation of various renewable energy systems.	3	3										2
EL1 322	SYSTEMS	CO 3	Design solar PV systems.	3	3										2
		CO 4	Explain different emerging energy conversion technologies and storage.	3	3										2
		CO 1	Develop mathematical models and conduct steady state and transient analysis of power system networks using standard software.	3	3	2	3	3			3	2	3		3
EEL332	POWER SYSTEMS LAB	CO 2	Develop a frequency domain model of power system networks and conduct the stability analysis.	3	2	1	3	3			1	2	3		2
EEL332	TOWER STSTEMS LAB	CO 3	Conduct appropriate tests for any power system component as per standards.	3	1	1	3	3	3	1	3	3	3		3
		CO 4	Conduct site inspection and evaluate performance ratio of solar power plant.	3	1	1	3	3	3	3	3	3	3	2	3

		1 (7)	Determine the characteristics of SCR and design triggering circuits for SCR based circuits.	3	3	2	2	2		3	2	3
		CO 2	Design, set up and analyse single phase AC voltage controllers.	3	3	2	2	2		3	2	3
EEL334	POWER ELECTRONICS	CO 3	Design, set up and test suitable gate drives for MOSFET/IGBT.	3	3	2	2	2		3	2	3
EEL334	LAB	CO 4	Design, set up and test basic inverter topologies.	3	3	2	2	2		3	2	3
		CO 5	Design and set up dc-dc converters.	3	3	2	2	2		3	2	3
		CO 6	Develop simulation models of dc-dc converters, rectifiers and inverters using modern simulation tools.	3	3	2	2	3		3	2	3

Course code	Course Name		Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
		CO 1	Develop the state variable representation of physical systems	3	3										2
			Analyse the performance of linear and nonlinear systems using state variable approach	3	3	2									2
EET401	ADVANCED CONTROL	CO 3	Design state feedback controller for a given system	3	3	3									2
EE1401	SYSTEMS	CO 4	Explain the characteristics of nonlinear systems	3	2										2
		CO 5	Apply the tools like describing function approach or phase plane approach for assessing the performance of nonlinear systems	3	3	2									2
		CO 6	Apply Lyapunov method for the stability analysis of physical systems.	3	3	2									2

EET463		CO 1	Explain the fundamental concepts of natural and artificial lighting schemes	3	2								
	ILLUMINATION	CO 2	Design efficient indoor lighting systems	2	2	3				1			1
	TECHNOLOGY	CO 3	Design efficient outdoor lighting systems	2	2	3			1			1	
		CO 4	Describe aesthetic and emergency lighting systems	2	2			3					
		CO 1	Choose the appropriate energy source depending on the available resources.	2					1	2			
		CO 2	Explain the concepts of solar thermal and solar electric systems.	3									
EET435	RENEWABLE ENERGY SYSTEMS	CO 3	Illustrate the operating principles of wind, and ocean energy conversion systems.	3					1	1			
		CO 4	Outline the features of biomass and small hydro energy resources	3					1	1			
		CO 5	Describe the concepts of fuel cell and hydrogen energy technologies	3									

EEQ413		CO 1	Identify academic documents from the literature which are related to her/his areas of interest	2	2	1	1		2	1					3
		CO 2	Read and apprehend an academic document from the literature which is related to her/ his areas of interest	3	3	2	3		2	1					3
	SEMINAR	CO 3	Prepare a presentation about an academic document	3	2			3			1		2		3
		CO 4	Give a presentation about an academic document	3				2			1		3		3
		CO 5	Prepare a technical report	3	3	3	2	2	2		2		3		3
		CO 1	Model and solve real world problems by applying knowledge across domains	2	2	2	1	2	2	2	1	1	1	1	2
		CO 2	Develop products, processes or technologies for sustainable and socially relevant applications	2	2	2		1	3	3	1	1		1	1
EED415	PROJECT PHASE I	CO 3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks									3	2	2	1
EED415	rkojeci mase i	CO 4	Plan and execute tasks utilizing available resources within timelines, following thical and professional norms					2			3	2	2	3	2
		CO 5	Identify technology/research gaps and propose innovative/creative solutions	2	3	3	1	2							1
		CO 6	Organize and communicate technical and scientific findings effectively in written and oral forms					2			2	2	3	1	1

	CONTROL SYSTEMS LAB	CO 1	Demonstrate the knowledge of simulation tools for control system design.	3	3	2	3	3		3	3	3	3
EEL411		CO 2	Develop the mathematical model of a given physical system by conducting appropriate experiments.	3	3	3	3	3		3	3	3	3
EEL411		CO 3	Analyse the performance and stability of physical systems using classical and advanced control approaches.	3	3	3	3	3		3	3	3	3
		CO 4	Design controllers for physical systems to meet the desired specifications.	3	3	3	3	3		3	3	3	3

Course code	Course Name		Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	ELECTRICAL SYSTEM DESIGN AND ESTIMATION		Explain the rules and regulations in the design of components for medium and high voltage installations.	3	1	2			1		2				
		CO 2	Design lighting schemes for indoor and outdoor applications.	3	2	3			1	1	1				1
EET402		CO 3	Design low/medium voltage domestic and industrial electrical installations.	3	1	3			1		1				1
		CO 4	Design, testing and commissioning of 11 kV transformer substation.	3	1	3			1		1			1	1
		CO 5	Design electrical installations in high rise buildings.	3	1	3			1	1	1				1

		CO 1	Analyse the significance of energy management and auditing.	2				1	1			
		CO 2	Discuss the energy efficiency and management of electrical loads.	2		1	1	1	1			
EET424	ENERGY MANAGEMENT	СОЗ	Apply demand side management techniques.	2		1	1	1	1			
		CO 4	Explain the energy management opportunities in industries.	2		1	1	1	1			
		CO 5	Compute the economic feasibility of the energy conservation measures.	2							2	
	SPECIAL ELECTRIC MACHINES	CO 1	Analyse the performance of different types of permanent magnet motors.	3	2			2				2
		CO 2	Analyse the performance of a stepper motor.	3	2			2				2
EET426		CO 3	Analyse the performance of different types of reluctance motors.	3	2			2				2
		CO 4	Explain the construction and principle of operation of servo motors, single phase motors and linear motors.	3	2			2				2
		CO 5	Analyse the performance of linear induction motors.	3	2			2				2
		CO 1	Identify the sensors/transducers suitable for industrial applications.	3	1							2
		CO 2	Design the signal conditioning circuits for industrial instrumentation and automation.	3	1							2
EET468	INDUSTRIAL INSTRUMENTATION AND AUTOMATION	CO 3	Analyze the concepts of data transmission and virtual instrumentation related to automation	3	1							2

		CO 4	Develop the logic for the process control applications using PLC programming	3	1										2
		CO 5	Describe the fundamental concepts of DCS and SCADA systems	3	1										2
EET404		CO 1	The objective of this Course viva is to ensure the basic knowledge of each student in the most fundamental core courses in the curriculum.												
	COMPREHENSIVE COURSE VIVA	CO 2	The viva voce shall be conducted based on the core subjects studied from third to eighth semester												
		CO 3	helps the learner to become competent in placement tests and other competitive examinations.												
		CO 1	Model and solve real world problems by applying knowledge across domains	2	2	2	1	2	2	2	1	1	1	1	2
		CO 2	Develop products, processes or technologies for sustainable and socially relevant applications	2	2	2		1	3	3	1	1		1	1
EED416	PROJECT PHASE II	CO 3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks									3	2	2	1
EED416	TROJECT THASE II	CO 4	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms					2			3	2	2	3	2
		CO 5	Identify technology/research gaps and propose innovative/creative solutions	2	3	3	1	2							1
		CO 6	Organize and communicate technical and scientific findings effectively in written and oral forms					2			2	2	3	1	1