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DEPARTMENT OF ELECTRICAL ENGINEERING

COURSE OUTCOME

SEMESTER - III

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	III	CLASS	SE
COURSE NO.	EEC301	ACADEMIC YEAR	2021-22
COURSE NAME	Engineering Mathematics-III		
NAME OF FACULTY	PROF. BHAGYASHREE NETKE		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC301.1	**Laplace Transform**	Student will be able to understand the concept of Laplace transform and its application to solve the real integrals in engineering problems.	
EEC301.2	**Inverse Laplace Transform**	Student will be able to understand the concept of inverse Laplace transform of various functions and its applications in engineering problems.	
EEC301.3	**Fourier Series**	Student will be able to expand the periodic function by using Fourier series for real life problems and complex engineering problems.	
EEC301.4	**Complex Variables**	Student will be able to understand complex variable theory, application of harmonic conjugate to get orthogonal trajectories and analytic function.	
EEC301.5	**Linear Algebra: Matrix Theory**	Student will be able to use matrix algebra to solve the engineering problems.	
EEC301.6	**Vector Differentiation and Integral**	Student will be able to apply the concepts of vector calculus in real life problems.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	III	CLASS	SE
COURSE NO.	EEC302	ACADEMIC YEAR	2021-22
COURSE NAME	Electrical Circuit Analysis		
NAME OF FACULTY	PROF. MUKESHKUMAR MISHRA		

COURSE OUTCOME	COURSE MODULE	DESCRIPTION
EEC302.1	**Electrical Circuit Analysis With DC Dependent Sources & AC sources**	The learner will be able to apply network theorems for the analysis of electrical circuits.
EEC302.2	**First and Second Order Circuits**	The learner will be able to obtain the transient and steady-state response of electrical circuits.
EEC302.3	**Two port parameters**	The learner will be able to develop and analyse transfer function model of system using two port network parameters.
EEC302.4	**Network Functions-Poles and Zeros**	The learner will be able to analyse time domain behavior from pole zero plot.
EEC302.5	**Graph Theory and Network Topology**	The learner will be able to analyse electrical network using graph theory.
EEC302.6	**Electrical Circuit Analysis Using Laplace Transforms**	The learner will be able to analyse the effect of switching conditions on electrical networks using differential equations and Laplace Theorem.

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	III	CLASS	SE
COURSE NO.	EEC303	ACADEMIC YEAR	2021-22
COURSE NAME	Fundamentals of Electrical Machines & Measurements		
NAME OF FACULTY	PROF. RITESH CHAVAN		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC303.1	**Basics of Magnetism**	The learner will be able to illustrate the principle of energy conversion in single and double excited machines.	
EEC303.2	**Electromechanical Energy Conversion**	The learner will be able to understand the performance parameters of DC machines.	
EEC303.3	**DC Machines**	The learner will be able to analyze the effect of performance parameters and application of DC machines.	
EEC303.4	**Analog Measurement**	The learner will be able to analyze the working of various analog and digital instruments in electrical and electronic measurements.	
EEC303.5	**Potentiometers, Bridges and Transducers**	The learner will be able to analyze the performance of bridges used in electrical and electronic measurements.	
EEC303.6	**Digital Measurements:**	The learner will be able to Illustrate the need for extension of range of meters and calibration in instruments.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	III	CLASS	SE
COURSE NO.	EEC304	ACADEMIC YEAR	2021-22
COURSE NAME	Electrical Power System-I		
NAME OF FACULTY	PROF. KAVITA MHASKAR		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC304.1	**Basic structure of power system**	The learner will be able to understand the power system and its components.	
EEC304.2	**Types of AC Transmission / Distribution Lines and Insulators**	The learner will be able to categorize the ac transmission / distribution lines and understand the insulators.	
EEC304.3	**Transmission / Distribution Line Parameters**	The learner will be able to evaluate the parameters of different types of ac transmission / distribution lines.	
EEC304.4	**Representation of Power System Components**	The learner will be able to draw the PU reactance diagram of a power system for analysis.	
EEC304.5	**Performance of Transmission Line**	The learner will be able to analyse the performance of transmission lines.	
EEC304.6	**Electric Cable and Earthing**	The learner will be able to understand the performance parameters of electric cable and earthing.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	III	CLASS	SE
COURSE NO.	EEC305	ACADEMIC YEAR	2021-22
COURSE NAME	Analog Electronics		
NAME OF FACULTY	PROF. BHUSHAN SAVE		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC305.1	**Diode**	The learner will be able to design and analyse various rectifiers and amplifier circuits.	
EEC305.2	**Bipolar Junction Transistor**	The learner will be able to analyse DC and AC parameters of BJT.	
EEC305.3	**Field Effect Transistor**	The learner will be able to analyse DC and AC parameters of MOSFET.	
EEC305.4	**Operational Amplifiers**	The learner will be able to understand the functioning of OP-AMP and design OP-AMP based circuits.	
EEC305.5	**Linear Voltage Regulators and Timer**	The learner will be able to practical design aspect of regulated power supply circuits using linear regulators.	
EEC305.6	**Special Purpose Semiconductor Devices**	The learner will be able to understand applications of commonly used special semiconductor devices.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	III	CLASS	SE
COURSE NO.	EEL301	ACADEMIC YEAR	2021-22
COURSE NAME	Electrical and Electronics Measurement Lab		
NAME OF FACULTY	PROF. RITESH CHAVAN		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEL301.1	-	The learner will be able to illustrate and analyze the performance of DC machines.	
EEL301.2	-	The learner will be able to demonstrate different speed control methods of DC motors.	
EEL301.3	-	The learner will be able to illustrate and analyze the working of various sensors, transducers and instruments used for measurement of the various physical parameters.	
EEL301.4	-	The learner will be able to demonstrate the use of bridges for measurements of passive electrical components.	
EEL301.5	-	The learner will be able to understand and analyse the working signal processing circuits used in measurements and instruments	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	III	CLASS	SE
COURSE NO.	EEL302	ACADEMIC YEAR	2021-22
COURSE NAME	Electronics Lab-I		
NAME OF FACULTY	PROF. BHUSHAN SAVE		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEL302.1	-	The learner will be able to identify the different types of semiconductor devices and demonstrate their applications in electronic circuits.	
EEL302.2	-	The learner will be able to analyse the performance of different types of rectifier with and without filter.	
EEL302.3	-	The learner will be able to determine the dc and ac parameters of various semiconductor devices.	
EEL302.4	-	The learner will be able to illustrate the frequency response of BJT/ MOSFET amplifier.	
EEL302.5	-	The learner will be able to understand the practical use of Op-amps in signal processing and waveform generators.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	III	CLASS	SE
COURSE NO.	EEL303	ACADEMIC YEAR	2021-22
COURSE NAME	Simulation Lab-I		
NAME OF FACULTY	PROF. KAVITA MHASKAR		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEL303.1	-	The learner will be able to develop knowledge of software packages to model and program electrical and electronics systems	
EEL303.2	-	The learner will be able to model different electrical and electronic systems and analyze the results	
EEL303.3	-	The learner will be able to articulate importance of software packages used for simulation in laboratory experimentation /research by analyzing the simulation results.	
EEL303.4	-	The learner will be able to simulate electric machines/circuits for performance analysis.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	III	CLASS	SE
COURSE NO.	EEL304	ACADEMIC YEAR	2021-22
COURSE NAME	Skill Based Lab (SBL) Applied Electrical Engineering Lab		
NAME OF FACULTY	PROF. ANOJKUMAR YADAV		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEL304.1	-	The learner will be able to demonstrate the effective use of various electrical and electronic measuring lab equipments.	
EEL304.2	-	The learner will be able to identify various electrical LV/HV substation, supply equipments and their network connection	
EEL304.3	-	The learner will be able to identify and use different low voltage protective switchgears along with residential /industrial wiring practices.	
EEL304.4	-	The learner will be able to repair and maintain common house-hold appliances.	
EEL304.5	-	The learner will be able to handle Electrical fire and shock hazards safety challenges in real practice.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER - IV

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	IV	CLASS	SE
COURSE NO.	EEC401	ACADEMIC YEAR	2021-22
COURSE NAME	Engineering Mathematics-IV		
NAME OF FACULTY	Prof. Bhagyashree Netke		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC401.1	**Complex Integration**	Student will be able to use the concepts of Complex Integration for evaluating integrals, computing residues & evaluate various contour integrals.	
EEC402.2	**Statistical Techniques**	Student will be able to apply the concept of Correlation and Regression to the engineering problems in data science, machine learning and AI.	
EEC402.3	**Probability Distributions**	Student will be able to apply the concepts of probability and expectation for getting the spread of the data and distribution of probabilities.	
EEC402.4	**Linear Algebra: Vector Spaces**	Student will be able to apply the concept of vector spaces and orthogonalization process in Engineering Problems.	
EEC402.5	**Linear Algebra: Quadratic Forms**	Student will be able to use the concept of Quadratic forms and Singular value decomposition which are very useful tools in various Engineering applications.	
EEC402.6	**Calculus of Variations**	Student will be able to find the extremals of the functional using the concept of Calculus of variation.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	IV	CLASS	S.E
COURSE NO.	EEC402	ACADEMIC YEAR	2021-22
COURSE NAME	Electrical AC Machines – I		
NAME OF FACULTY	Prof. Sangita Kamble		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC402.1	**Single phase Transformer**	The learner will be able to illustrate working principle and performance of single phase transformer under different operating conditions	
EEC402.2	**Autotransformer**	The learner will be able to understand working principle of autotransformer.	
EEC402.3	**Three Phase Transformer**	The learner will be able to analyze various types of connections and performance of three phase transformer under various conditions.	
EEC402.4	**Three Phase Induction Motor**	The learner will be able to demonstrate working principle and evaluate performance of three phase induction motor under various operating conditions.	
EEC402.5	**Starting and Speed control of Three Phase Induction Motor**	The learner will be able to exemplify various starting methods and speed control of three phase induction motor.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	IV	CLASS	S.E
COURSE NO.	EEC403	ACADEMIC YEAR	2021-2022
COURSE NAME	Digital Electronics		
NAME OF FACULTY	Prof. Bhushan Save		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC403.1	**Fundamentals of Digital Systems and Logic families**	The learner will be able to perform various conversion of number systems	
EEC403.2	**Combinational Digital Circuits**	The learner will be able to understand working of logic families and logic gates.	
EEC403.3	**Sequential Digital Circuits**	The learner will be able to design and implement combinational circuits.	
EEC403.4	**A/D and D/A Converters**	The learner will be able to design and implement sequential circuits.	
EEC403.5	**Semiconductor Memories**	The learner will be able to understand working of logic families and logic gates.	
EEC403.6	**Programmable Logic Devices**	The learner will be able to use PLDs to implement the given logical problem.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	IV	CLASS	SE
COURSE NO.	EEC404	ACADEMIC YEAR	2021-22
COURSE NAME	Power Electronic Devices and Circuits		
NAME OF FACULTY	Prof. Chitralekha Vangala		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC404.1	**Thyristors & Power semiconductor devices**	The learner will be able to understand the basic operation and characteristics of various semi controllable and fully controllable devices	
EEC404.2	**Controlled Rectifiers**	The learner will be able to analyse various single phase and three phase power converter circuits and understand their applications.	
EEC404.3	**Inverter**	The learner will be able to analyse ac to dc converter circuits and their applications.	
EEC404.4	**Auxiliary Circuits**	The learner will be able to identify and describe various auxiliary circuits and requirements in power electronics applications such as gate driver circuit, snubber circuits and heat sinks.	
EEC404.5	**DC to DC Converter**	The learner will be able to apply the basic concepts to select devices and converters for various applications	

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SEMESTER	IV	CLASS	S.E
COURSE NO.	EEC405	ACADEMIC YEAR	2021-22
COURSE NAME	Electric and Hybrid Electric Vehicle		
NAME OF FACULTY	Prof. Mukeshkumar Mishra		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC405.1	**Introduction**	The learner will be able to identify and describe the history and evolvement of electric & hybrid electric vehicles.	
EEC405.2	**Drive-train Topologies**	The learner will be able to identify and describe the principles of various EV/HEVs drive train topologies.	
EEC405.3	**DC and AC Machines for Propulsion Applications**	The learner will be able to select electric propulsion system components for EV/HEV drives for the desirable performance and control.	
EEC405.4	**Energy Sources for EV/HEV**	The learner will be able to compare and evaluate various energy sources and energy storage components for EV/HEV.	
EEC405.5	**Drive-train Modelling and Design Considerations**	The learner will be able to model, analyze and design EV/HEV drive train with energy management strategies.	
EEC405.6	**Energy Management Strategies and Energy Efficiency**	The learner will be able to recognize the need to adapt and engage in operations EV/HEV for sustainable transportation system.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	IV	CLASS	S.E
COURSE NO.	EEL401	ACADEMIC YEAR	2021-22
COURSE NAME	Electrical AC Machines Lab-I		
NAME OF FACULTY	Prof. Sangita Kamble		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC406.1	-	The learner will be able to demonstrate the working principles and types of connections of 1φ and 3φ transformers.	
EEC406.2	-	The learner will be able to analyze the performance of 3φ transformer under various operating conditions.	
EEC406.3	-	The learner will be able to evaluate the performance of 3φ induction motor by carrying no load test , blocked rotor test and load test	
EEC405.4	-	The learner will be able to illustrate the operation of various type of 3φ induction motor starters	
EEC406.5	-	The learner will be able to illustrate different methods of speed control and braking of 3φ induction motors.	

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COURSE NO.	EEL402	ACADEMIC YEAR	2021-22
COURSE NAME	Python Programming Lab		
NAME OF FACULTY	Prof. Saniket Kudoo		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEL402.1	-	The learner will be able to describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python	
EEL402.2	-	The learner will be able to express different Decision Making statements and Functions	
EEL402.3	-	The learner will be able to object oriented programming in Python	
EEL402.4	-	The learner will be able to understand and summarize different File handling operations	
EEL402.5	-	The learner will be able to explain how to design GUI Applications in Python and evaluate different database operations	

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DEPARTMENT OF ELECTRICAL ENGINEERING

COURSE NO.	EEL403	ACADEMIC YEAR	2021-22
COURSE NAME	Electronics Lab II		
NAME OF FACULTY	Prof. Bhushan Save		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEL402.1	-	The learner will be able to use various digital logic Gates, flip-flops and counters for various applications	
EEL402.2	-	The learner will be able to build, design and analyse sequential / combinational circuits.	
EEL402.3	-	The learner will be able to understand the operation various power electronics devices and circuits	
EEL402.4	-	The learner will be able to use power converters for various real life applications	

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DEPARTMENT OF ELECTRICAL ENGINEERING

COURSE NO.	EEL404	ACADEMIC YEAR	2021-22
COURSE NAME	Skill Based Lab- II PCB Design and Fabrication Lab		
NAME OF FACULTY	Prof. Mukeshkumar Mishra		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEL404.1	-	The learner will be able to understand types of PCBs and various tools used for PCB design.	
EEL404.2	-	The learner will be able to identify various electrical/electronic components and their packages/ footprints.	
EEL404.3	-	The learner will be able to illustrate the use of PCB CAD tools and their features for the practical designs.	
EEL404.4	-	The learner will be able to design the schematic, board layout for simple, moderately complex and complex circuits.	
EEL404.5	-	The learner will be able to fabricate and assemble the PCBs for simple and moderately complex circuits.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER - V

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	V	CLASS	T.E
COURSE NO.	EEC501	ACADEMIC YEAR	2021-22
COURSE NAME	Power System-II		
NAME OF FACULTY	PROF. RITESH CHAVAN		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC501.1	**Synchronous Generator-Introduction**	The learner will be able to illustrate the working of synchronous generator	
EEC501.2	**Analysis of Synchronous Generator**	The learner will be able to determine the voltage regulation of synchronous generator by different methods	
EEC501.3	**Performance of Synchronous Generator**	The learner will be able to analyze the parallel operation of synchronous generators.	
EEC501.4	**Salient pole synchronous generator**	The learner will be able to apply Blondel's two reaction theory and solve simple problems on salient pole synchronous machines.	
EEC501.5	**Synchronous Motor**	The learner will be able to analyze the operation of synchronous motor.	
EEC501.6	**Theory of Synchronous Machines**	The learner will be able to derive the basic machine relations in dq0 variables for a synchronous machine without considering damper winding.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	V	CLASS	T.E
COURSE NO.	EEC502	ACADEMIC YEAR	2021-22
COURSE NAME	Electrical Power System II		
NAME OF FACULTY	Prof. RITESH CHAVAN		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC502.1	**Symmetrical Fault Analysis**	The learner will be able to understand and analyse unsymmetrical faults on transmission line	
EEC502.2	**Symmetrical Components**	The learner will be able to analyse symmetrical component and construct sequence network	
EEC502.3	**Unsymmetrical Fault Analysis**	The learner will be able to analyse symmetrical faults on transmission lines.	
EEC502.4	**Power System Transients**	The learner will be able to understand power system transients	
EEC502.5	**Lightning and Insulation Coordination**	The learner will be able to understand phenomenon of lightning and insulation coordination.	
EEC502.6	**Corona**	The learner will be able to understand concept of corona.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	V	CLASS	T.E
COURSE NO.	EEC503	ACADEMIC YEAR	2021-22
COURSE NAME	Control System		
NAME OF FACULTY	Prof. CHITRALEKHA VANGALA		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC503.1	**Introduction to Control System**	The learner will be able to demonstrate an understanding of the fundamentals of (feedback) control systems.	
EEC503.2	**Mathematical Model of Physical System & Time Domain Analysis**	The learner will be able to determine and use models of physical systems in forms suitable for use in the analysis and design of control systems.	
EEC503.3	**State Variable Analysis**	The learner will be able to express and solve system equations in state-variable form (state variable models).	
EEC503.4	**Root locus Techniques**	The learner will be able to determine the time and frequency-domain responses of first and second-order systems to step and sinusoidal (and to some extent, ramp) inputs.	
EEC503.5	**Frequency Domain Analysis**	The learner will be able todetermine the (absolute) stability of a closed-loop control system	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	V	CLASS	T.E
COURSE NO.	EEC504	ACADEMIC YEAR	2021-22
COURSE NAME	Electromagnetic Field and Wave		
NAME OF FACULTY	Anojkumar Yadav		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC504.1	**Vector Basics**	The learner will be able to apply knowledge of mathematics and physics in electrical engineering field.	
EEC504.2	**Static Electric Fields**	The learner will be able to analyze electrostatic fields	
EEC504.3	**Static Magnetic Fields**	The learner will be able to apply and analyse magneto-static fields.	
EEC504.4	**Electric and Magnetic Fields in Materials**	The learner will be able to analyze the effect of material medium on electric and magnetic fields.	
EEC504.5	**Time varying Electric and Magnetic Fields**	The learner will be able to analyze and formulate time varying electric and magnetic fields.	
EEC504.6	**Electromagnetic Wave theory**	The learner will be able to formulate wave equations for Electromagnetic wave propagation in different media.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	V	CLASS	T.E
COURSE NO.	EEDO5011	ACADEMIC YEAR	2021-22
COURSE NAME	Renewable Energy Sources		
NAME OF FACULTY	PROF. RAHUL ABHYANKAR		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEDO5011.1	**Introduction**	The learner will be able to understand different types conventional energy sources and their reserves	
EEDO5011.2	**Solar Energy (Thermal Energy applications)**	The learner will be able to identify and analyse the process of power generation through solar thermal energy utilization.	
EEDO5011.3	**Solar Energy (Direct Electricity Applications)**	The learner will be able to identify and analyse the process of power generation through solar photovoltaic energy utilization.	
EEDO5011.4	**Wind Energy**	The learner will be able to identify and describe the various components and types of Wind Energy system.	
EEDO5011.5	**Fuel Cell**	The learner will be able to identify and describe the basic operation and types of Fuel cell system	
EEDO5011.6	**Other Sources**	The learner will be able to understand different types of other non-conventional energy sources	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	V	CLASS	T.E
COURSE NO.	EEL501	ACADEMIC YEAR	2021-22
COURSE NAME	Electrical AC Machines Lab-II		
NAME OF FACULTY	PROF. PIYALI MONDAL		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEL501.1	-	The learner will be able to analyze the operation of synchronous machines.	
EEL501.2	-	The learner will be able to determine the voltage regulation of synchronous machines.	
EEL501.3	-	The learner will be able to analyze the synchronization (or parallel operation) of synchronous machines.	
EEL501.4	-	The learner will be able to determine the parameters of synchronous machines	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	V	CLASS	T.E
COURSE NO.	EEL502	ACADEMIC YEAR	2021-22
COURSE NAME	Simulation Lab-II		
NAME OF FACULTY	PROF. RAHUL ABHYANKAR		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEL502.1	-	The learner will be able to develop the skill to use the software packages to model and program electrical and electronics systems	
EEL502.2	-	The learner will be able to model different electrical and electronic systems and analyze the results	
EEL502.3	-	The learner will be able to articulate importance of software packages used for simulation in laboratory experimentation /research/industry by analyzing the simulation results.	
EEL502.4	-	The learner will be able to simulate circuits for performance analysis.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	V	CLASS	T.E
COURSE NO.	EEL503	ACADEMIC YEAR	2021-2220
COURSE NAME	Electrical Machines Lab -III		
NAME OF FACULTY	PROF. ANOJKUMAR YADAV		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEL503.1	-	The learner will be able to illustrate the functioning of various components of control system.	
EEL503.2	-	The learner will be able to analyse the response of physical system for various inputs.	
EEL503.3	-	The learner will be able to analyze and interpret stability of the system through Root Locus, Bode plot and Nyquist plots	
EEL503.4	-	The learner will be able to execute time response analysis of a second order control system using MATLAB	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	V	CLASS	T.E
COURSE NO.	EEL504	ACADEMIC YEAR	2018-2019
COURSE NAME	Professional Communication & Ethics-II		
NAME OF FACULTY	PROF. PRASHANT PAWAR		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEL504.1	-	The learner will be able to Plan and prepare effective business/ technical documents which will in turn provide solid foundation for their future managerial roles.	
EEL504.2	-	The learner will be able to strategize their personal and professional skills to build a professional image and meet the demands of the industry.	
EEL504.3	-	The learner will be able to merge successful in group discussions, meetings and result-oriented agreeable solutions in group communication situations.	
EEL504.4	-	The learner will be able to deliver persuasive and professional presentations.	
EEL504.5	-	The learner will be able to develop creative thinking and interpersonal skills required for effective professional communication.	
EEL504.6	-	The learner will be able to apply codes of ethical conduct, personal integrity and norms of organizational behavior.	

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SEMESTER – VI

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	VI	CLASS	TE
COURSE NO.	EEC601	ACADEMIC YEAR	2021-22
COURSE NAME	Power System Protection and Switchgear		
NAME OF FACULTY	Prof. Rahul Abhyankar		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC601.1	**Substation Equipment and switching devices**	The learner will be able to select the appropriate switching/protecting device for substations.	
EEC601.2	**Circuit Breakers and Fuses**	The learner will be able to discriminate between the application of circuit breaker and fuses as a protective device.	
EEC601.3	**Protective relaying, Static & Numerical Relays**	The learner will be able to understand the basic concept of relay, types of relay and their applications in power system.	
EEC601.4	**Protection of Transmission Lines**	The learner will be able to select the specific protection required for different components of power system according to the type of fault.	
EEC601.5	**Protection of Transmission Lines**	The learner will be able to apply the specific protection provided for different types of transmission lines.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	VI	CLASS	TE
COURSE NO.	EEC602	ACADEMIC YEAR	2021-22
COURSE NAME	Microcontroller Applications		
NAME OF FACULTY	Prof. Ashwini Haryan		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC602.1	**Microcontroller & PIC18F Programming Model and Instruction Set**	The learner will be able to analyse the difference between microprocessor and microcontroller based systems.	
EEC602.2	**PIC 18 Support Devices**	The learner will be able to write, debug and execute the software programs for internal peripheral devices of microcontroller.	
EEC602.3	**Parallel Ports and Serial Communication**	The learner will be able to write, debug and execute the software programs for external peripheral devices for microcontroller based systems.	
EEC602.4	**PIC Programming in C & Microcontroller Applications**	The learner will be able to design and implement the peripheral devices interfacing with microcontroller	

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SEMESTER	VI	CLASS	TE
COURSE NO.	EEC603	ACADEMIC YEAR	2021-22
COURSE NAME	Control System Design		
NAME OF FACULTY	Prof. Kushal Suvarna		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC603.1	**Introduction to the Compensator & Design of Compensators using Root Locus Technique**	The learner will be able to define fundamental control system design specifications and basic principles of controller design.	
EEC603.2	**Design of Compensators using Frequency Response Technique (Bode Plot)**	The learner will be able to understand the basic design of various compensators.	
EEC603.3	**Design of Compensators using State variable approach**	The learner will be able to design compensators using root locus techniques.	
EEC603.4	**Digital control System**	The learner will be able to design modern controllers based on the state space techniques	
EEC603.5	**Design of Digital Compensators**	The learner will be able to recognize the importance of observability and controllability for system design.	

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SEMESTER	VI	CLASS	TE
COURSE NO.	EEC604	ACADEMIC YEAR	2021-22
COURSE NAME	Signals and Systems		
NAME OF FACULTY	Prof. Chitralekha Vangala		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC604.1	**Classification of Signals and Systems**	The learner will be able to discriminate continuous and discrete time signals and systems.	
EEC604.2	**Z-Transform**	The learner will be able to understand the transformation of discrete time signal to Z domain.	
EEC604.3	**Frequency Response & Fourier Series & Discrete and Fast Fourier Transform**	The learner will be able to analyse frequency response of systems using Z domain.	
EEC604.4	**Design of FIR & IIR System**	The learner will be able to design, implementation, analysis and comparison of digital filters for processing of discrete time signals	

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SEMESTER	VI	CLASS	TE
COURSE NO.	EEDO6014	ACADEMIC YEAR	2021-22
COURSE NAME	Energy Storage		
NAME OF FACULTY	Prof. Anojkumar Yadav		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEDO6014.1	**Introduction to Energy Storage systems and components**	To illustrate the importance of energy storage systems in Power systems and other application domains	
EEDO6014.2	**Thermal Energy Storage**	To illustrate the operational features of various energy storage technologies	
EEDO6014.3	**Mechanical Energy Storage**	To understand the principles and types of thermal, mechanical, electrochemical and electrical energy storage systems.	
EEDO6014.4	**Electrochemical Energy Storage**	To compare and contrast different types of Energy storage systems	
EEDO6014.5	**Electrical Energy Storage**	To illustrate the hybridization of various ES technology to improve the performance	
EEDO6014.6	**Design, Sizing and Applications of Energy Storage**	To calculate the capacity of ES system for various application requirements,	

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SEMESTER	VI	CLASS	T.E
COURSE NO.	EEL601	ACADEMIC YEAR	2021-22
COURSE NAME	Power System Protection And Switchgear Lab		
NAME OF FACULTY	PROF. Rahul Abhyankar		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEL601.1	-	The learner will be able To understand the working principle of various protective devices like Circuit breakers, fuses, switches and contactors.	
EEL601.2	-	The learner will be able to understand the concept of various over current protection scheme and its applications in power system.	
EEL601.3	-	The learner will be able to understand different protection schemes of transformer and Induction motor.	
EEL601.4	-	The learner will be able to understand protection schemes of transmission line.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	VI	CLASS	T.E
COURSE NO.	EEL602	ACADEMIC YEAR	2021-22
COURSE NAME	Microcontroller Applications Lab		
NAME OF FACULTY	Prof. Ashwini Haryan		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEL602.1	-	The learner will be able to write, debug and execute Assembly language based programs.	
EEL602.2	-	The learner will be able to write, debug and execute embedded language based programs.	
EEL602.3	-	The learner will be able to design and implement the interfacing of internal peripheral devices.	
EEL603.3	-	The learner will be able to design and implement the interfacing of external peripheral devices.	

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SEMESTER	VI	CLASS	T.E
COURSE NO.	EEL603	ACADEMIC YEAR	2021-22
COURSE NAME	Control System Design Lab		
NAME OF FACULTY	Prof. Chitralekha Vangala		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEL603.1	-	The learner will be able to implement various types of compensators and control algorithms using simulation platforms	
EEL603.2	-	The learner will be able to apply root-locus & Bode Plot techniques to analyze and design control systems.	
EEL603.3	-	The learner will be able to able to design digital controllers, assess their design through the constraint specifications	

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SEMESTER	VI	CLASS	T.E
COURSE NO.	EEL604	ACADEMIC YEAR	2021-22
COURSE NAME	SBL-III: Industrial Automation Lab		
NAME OF FACULTY	Prof. Anojkumar Yadav		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEL604.1	-	The learner will be able to comprehend with various components and subsystems used in industrial automation	
EEL604.2	-	The learner will be able to understand the integration of components and sub-systems.	
EEL604.3	-	The learner will be able to interface the microcontroller / PLC with external devices/ sensors/ actuators.	
EEL604.4	-	The learner will be able to interface the microcontroller / PLC with control circuits.	
EEL604.5	-	The learner will be able to design /implement / integrate such systems for any given applications	

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SEMESTER – VII

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	VII	CLASS	BE
COURSE NO.	EEC701	ACADEMIC YEAR	2021-22
COURSE NAME	Power System - III		
NAME OF FACULTY	Prof. KAVITA MHASKAR		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC701.1	**Economic Operation of Power System**	Students will be able to analyze power system problem and find out its solutions	
EEC701.2	**Automatic Generation and voltage control**	Students will be able to identify and analyze the dynamics of power systems and methods to improve stability of system.	
EEC701.3	**Load Flow Studies, Power System Stability**	Students will be able to study different methods of load flow solutions.	
EEC701.4	**Voltage Stability, Power system security and interchange of power**	Students will be able to application of optimization methods for task like economic load dispatch	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	VII	CLASS	B.E
COURSE NO.	EEC702	ACADEMIC YEAR	2021-2220
COURSE NAME	Drives and Control		
NAME OF FACULTY	Prof. PIYALI MONDAL		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC702.1	**Electrical Drives: Introduction &Dynamics**	Students will be able to understand the dynamics of electrical drive.	
EEC702.2	**Selection of Motor Power Rating**	Students will be able to understand the motor power rating calculation for a specific application for reliable operation.	
EEC702.3	**Control of Electrical Drives**	Students will be able to understand the modes of operation and close loop control of electrical drive.	
EEC702.4	**DC Drives**	Students will be able to analyze the speed control of DC drives in an energy efficient manner using power electronics.	
EEC702.5	**AC Drives**	Students will be able to analyze the speed control of induction motor drive using various methods.	
EEC702.6	**Advanced control techniques**	Students will be able to learn the advance control techniques for AC drives.	

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SEMESTER	VII	CLASS	BE
COURSE NO.	EEC703	ACADEMIC YEAR	2021-2220
COURSE NAME	High Voltage Direct Current Transmission		
NAME OF FACULTY	PROF. SUNIL SUKNALE		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC703.1	**Introduction to HVDC transmission**	Students will be able to identify significance of dc over ac transmission systems, types of HVDC link, Components of HVDC system and applications.	
EEC703.2	**Analysis of the Bridge rectifier**	Students will be able to analyse multi-pulse converters.	
EEC703.3	**HVDC System Control**	Students will be able to understand the basic control of HVDC system and its limitation, features and implementation.	
EEC703.4	**Converter Control**	Students will be able to understand converter firing control schemes for starting and stopping of HVDC link.	
EEC703.5	**Faults and protection**	Students will be able to understand and analyze faults and protection of HVDC system.	
EEC703.6	**Harmonics & Filters**	Students will be able to understand harmonics, their causes, effects and use of different filters.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	VII	CLASS	BE
COURSE NO.	EEDLO7032	ACADEMIC YEAR	2021-22
COURSE NAME	Electric Vehicle Technology		
NAME OF FACULTY	Prof. MUKESHKUMAR MISHRA		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEDLO7032.1	**Basics of vehicles mechanisms**	Students will be able to identify and describe the history and evolvement of electric & hybrid electric vehicles to emphasize on the need and importance of EV/HEV for sustainable future.	
EEDLO7032.2	**Drive-train Topologies**	Students will be able to identify and describe the principles of various EV/HEVs drive train topologies along with their power flow control and fuel efficiency estimation.	
EEDLO7032.3	**DC and AC Machines for Propulsion Applications**	Students will be able to design and select electric propulsion system components for EV/HEV drives suitability for the desirable performance and control**.**	
EEDLO7032.4	**Energy Sources for EV/HEV**	Students will be able to compare and evaluate various energy sources and energy storage components for EV and HEV applications.	
EEDLO7032.5	**Modeling and design of the drive trains**	Students will be able to model, analyze and design EV/HEV drive train with energy management strategies**.**	
EEDLO7032.6	**Energy Management Strategies and Energy Efficiency**	Students will be able to recognize the need to adapt and engage in operations EV/HEV with the absolute technological change in the transportation system for sustainable future.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	VII	CLASS	BE
COURSE NO.	ILO7018	ACADEMIC YEAR	2021-22
COURSE NAME	Energy Audit and Management		
NAME OF FACULTY	Prof. RAHUL ABHYANKAR		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
ILO7018.1	**Energy Scenario & Energy Audit Principles**	Student will be able to identify and describe present state of energy security and its importance.	
ILO7018.2	**Energy Management and Energy Conservation in Electrical System**	Student will be able to identify and describe the basic principles and methodologies adopted in energy audit of an utility.	
ILO7018.3	**Energy Management and Energy Conservation in Thermal Systems**	Student will be able to describe the energy performance evaluation of some common electrical installations and identify the energy saving opportunities.	
ILO7018.4	**Energy Performance Assessment**	Student will be able to describe the energy performance evaluation of some common thermal installations and identify the energy saving opportunities.	
ILO7018.5	**Energy conservation in Buildings**	Student will be able to analyze the data collected during performance evaluation and recommend energy saving measures.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	VII	CLASS	BE
COURSE NO.	EEL701	ACADEMIC YEAR	2021-22
COURSE NAME	Simulation Lab -III		
NAME OF FACULTY	PROF. MUKESHKUMAR MISHRA		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEL701.1	-	Students will be able to code or simulate HVDCT systems for its analysis.	
EEL701.2	-	Students will be able to code or simulate power system for its analysis.	
EEL701.3	-	Students will be able to code or simulate electrical drives for its analysis.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	VII	CLASS	BE
COURSE NO.	EEL702	ACADEMIC YEAR	2021-22
COURSE NAME	Drives and Control Lab		
NAME OF FACULTY	Prof. PIYALI MONDAL		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEDLO7032.1	-	Students will be able to analyse the dynamic performance of electrical ac and dc drives.	
EEDLO7032.2	-	Students will be able to analyse the dynamics of braking of electrical ac and dc motors.	

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SEMESTER – VIII

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	VIII	CLASS	B.E
COURSE NO.	EEC801	ACADEMIC YEAR	2021-2022
COURSE NAME	Design, Management and Auditing of Electrical System		
NAME OF FACULTY	Prof. Piyali Mondal		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC801.1	**Introduction**	To illustrate the aspects of designing electrical distribution network	
EEC801.2	**Design of Power Distribution System**	To do sizing and selecting transformer as required for distribution system	
EEC801.3	**Design of Switchgear Protection and Auxiliary system**	To do sizing, switchgear and cable, interior lighting design as required for distribution system.	
EEC801.4	**Energy Monitoring and Targeting**	To illustrate the aspects of Energy monitoring and targeting electrical distribution network	
EEC801.5	**Energy Audit**	To illustrate Engineering knowledge in energy audit	
EEC801.6	**Energy Efficient Technologies**	To illustrate Engineering knowledge in energy efficient technologies to improve energy efficiency.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	VIII	CLASS	B.E
COURSE NO.	EEC802	ACADEMIC YEAR	2021-2022
COURSE NAME	Flexible AC Transmission System		
NAME OF FACULTY	Prof. Piyali Mondal		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC802.1	**FACTS Concepts and General System Considerations**	Illustrate the aspects of flexible ac transmission system over conventional AC transmission system	
EEC802.2	**Load Compensation**	Analyze the concept of load compensation.	
EEC802.3	**Static shunt compensators**	Categorize the static shunt compensation for transmission lines.	
EEC802.4	**Static series compensation**	Categorize the static series compensation for transmission lines	
EEC802.5	**Static voltage and phase angle regulators**	Outline the concept of voltage and phase angle regulators.	
EEC802.6	**Unified Power Flow Controller**	Understand unified power flow controllers using circuit diagrams and phasors.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	VIII	CLASS	B.E
COURSE NO.	EEDLO8044	ACADEMIC YEAR	2021-2022
COURSE NAME	Power System Planning and Reliability		
NAME OF FACULTY	Prof. Rahul Abhyankar		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEC803.1	**Load Forecasting**	Should be able to study the importance of load forecasting in power system	
EEC803.2	**System Planning**	Should be able to study the importance of system planning in power system	
EEC803.3	**Reliability of Systems**	Should be able to understand the concept of system reliability in power system	
EEC803.4	**Generating Capacity**	Should be able to make a generation system model for the power system in terms of frequency and duration of failure	
EEC803.5	**Operating Reserve**	Should be able to understand the concept of PJM in power system	
EEC803.6	**Composite generation and transmission system**	Should be able to calculate reliability indices of the power system based on the system model and the load curve.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	VIII	CLASS	B.E
COURSE NO.	ILO8021	ACADEMIC YEAR	2021-2022
COURSE NAME	Project Management		
NAME OF FACULTY	Prof. Sangita Kamble		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
ILO8021.1	**Project Management Foundation**	Student will be able to apply selection criteria and select an appropriate project from different options.	
ILO8021.2	**Initiating Projects**	Student will be able to write work break down structure for a project and develop a schedule based on it.	
ILO8021.3	**Project Planning and Scheduling**	Student will be able to identify opportunities and threats to the project and decide an approach to deal with them strategically.	
ILO8021.4	**Planning Projects**	Student will be able to use Earned value technique and determine & predict status of the project.	
ILO8021.5	**Executing Projects & Project Leadership and Ethics**	Student will be able to capture lessons learned during project phases and document them for future reference	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	VIII	CLASS	B.E
COURSE NO.	EEL801	ACADEMIC YEAR	2021-2022
COURSE NAME	Simulation Lab- IV		
NAME OF FACULTY	Prof. Chitralekha Vangala		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEL801.1	-	Student will be able to analyze the transmission line performance with and without FACTS controllers using simulations.	
EEL801.2	-	Student will be able to analyze the operation of various electrical systems using simulation.	

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DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER	VIII	CLASS	B.E
COURSE NO.	EEL802	ACADEMIC YEAR	2021-2022
COURSE NAME	Electrical System Design Lab		
NAME OF FACULTY	Prof. Kavita Mhaskar		
COURSE OUTCOME	COURSE MODULE	DESCRIPTION	
EEL802.1	-	Student will be able to design electrical system for different applications.	