

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

B.TECH - FULL TIME (UG - 2022)

COURSE CODE	COURSE TITLE	СО	COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	P012
		CO1	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.	√											
22148S11P	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	CO2	Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering									√			
		CO3	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.								✓				

		CO1	Ability to develop various representations of system based on the knowledge of					 						
		CO2	Mathematics, Science and Engineering fundamentals.			√								
		CO3	Ability to do time domain and frequency domain analysis of various models of linear system.			✓								
22153C12P	CONTROL SYSTEM	CO4	Ability to interpret characteristics of the system to develop mathematical model.				✓							
		CO5	Ability to design appropriate compensator for the given specifications.							✓				
		C06	Ability to come out with solution for complex control problem.									✓		
		C07	Ability to understand use of PID controller in closed loop system.										√	
	CIRCUIT	CO1	Ability analyse electrical circuits		✓									
	THEORY	CO2	Ability to apply circuit theorems				✓							
22153C13P		CO3	Ability to analyse AC and DC Circuits			✓								
		CO1	Upon Completion of the course, the students will be ability to:								✓			
22153C14P	ELECTRONIC CIRCUITS	CO2	Explain the structure and working operation of basic electronic devices.	_ _						✓				
		CO3	Able to identify and differentiate both active and passive elements						√					

		CO4	Analyze the characteristics of different electronic devices such as diodes and transistors	✓								
		CO5	Choose and adapt the required components to construct an amplifier circuit. Employ the acquired knowledge in design and analysis of oscillators								√	
		CO1	Ability to analyze the magnetic-circuits.									✓
22153C15P	ELECTRICAL MACHINES – I	CO2	Ability to acquire the knowledge in constructional details of transformers. Ability to understand the concepts of electromechanical energy conversion. Ability to acquire the knowledge in working principles of DC Generator.								V	
		CO3	Ability to acquire the knowledge in working principles of DC Motor							✓		
		CO4	Ability to acquire the knowledge in various losses taking place in D.C. Machines						√			
		CO1	Understand the basic concepts and techniques of solving algebraic equations.					✓				
	NUMERICAL METHODS	CO2	Appreciate the numerical techniques of interpolation and error approximations in various intervals in real life situations.		√							
22148S21P		CO3	Apply the numerical techniques of differentiation and integration for engineering problems.				✓					

		CO4	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations. To understand ethical issues,		✓							
22153C22P	OPTIMISATION TECHNIQUES	CO1	environmental impact and acquire management skills.				√					
		CO1	Ability to understand MMF curves and armature windings.				√					
		CO2	Ability to acquire knowledge on Synchronous motor.				√					
22153C23P	ELECTRICAL MACHINES-II	CO3	Ability to understand the construction and working principle of Three phase Induction Motor						✓			
		CO4	Ability to understand the construction and working principle of Special Machines					✓				
		CO5	Ability to predetermine the performance characteristics of Synchronous Machines.							✓		
		CO1	Ability to design combinational and sequential Circuits.						✓			
		CO2	Ability to simulate using software package.		✓							
22153C24P	DIGITAL	CO3	Ability to study various number systems and simplify the logical expressions using	✓								
22153C24P	ELECTRONICS	CO4	Boolean functions					✓				
		CO5	Ability to design various synchronous and asynchronous circuits.			✓						
		C06	Ability to introduce asynchronous sequential circuits and PLDs								✓	

		C07	Ability to introduce digital simulation for development of application oriented logic circuits.									✓
		CO1	To understand the concepts of Lines and Insulators.		√							
22153C25P	TRANSMISSION AND DISTRIBUTION	CO2	To acquire knowledge on the performance of Transmission lines.						√			
		CO3	To acquire knowledge on Underground Cabilitys	√								
		CO1	Eigenvalues and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices.							√		
22148S31CP	PROBABILITY AND STATISTICS	CO2	Gradient, divergence and curl of a vector point function and related identities.						√			
		CO3	Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification.				✓					
22153C32P	LINEAR INTEGRATED CIRCUITS AND APPLICATIONS	CO1	Ability to understand and analyse, linear and digital electronic circuits.		✓							
		CO1	Ability to analyse AC-AC and DC-DC and DC-AC converters.		✓							
22153C33P	POWER ELECTRON	N C 92	Ability to choose the converters for real time applications.			√						

		CO1	To understand the concepts of Fundamentals of electrical and electronic instruments						√				
	MEASUREMENT	CO2	Ability to compare between various measurement techniques								√		
22153C34P	S AND INSTRUMENTAT	CO3	To acquire knowledge on Various storage and display devices									√	
	ION	CO4	To understand the concepts Various transducers and the data acquisition systems		√								
		CO5	Ability to model and analyze electrical and electronic Instruments and understand the operational features of display Devices and Data Acquisition System.				✓						
		CO1	Ability to conduct performance tests on DC and AC machines			√							
221521 250	DC AND AC ELECTRICAL	CO2	Ability to understand and analyze EMF and MMF methods							√			
22153L35P	MACHINES LABORATORY	CO3	Ability to analyze the characteristics of V and Inverted V curves						√				
		CO4	Ability to understand the importance of Synchronous machines					√					
		CO5	Ability to understand the importance of Induction Machines	✓									

		CO1	Ability to understand and analyze Electromagnetic and Static Relays. Ability to suggest suitability circuit breaker.								✓	V
22153C41P	PROTECTION AND SWITCHGEAR	CO3	Ability to find the causes of abnormal operating conditions of the apparatus and system.								√	,
	SWITCHGEAR	CO4	Ability to analyze the characteristics and functions of relays and protection schemes. Ability to study about the apparatus protection, static and numerical relays.							✓		
		CO5	Ability to acquire knowledge on functioning of circuit breaker.						✓			
		CO1	Ability to understand Generation and measurement of high voltage.					√				
	************	CO2	Ability to understand High voltage testing.	✓								
22153C42P	HIGH VOLTAGE DC TRANSMISSION	CO3	Ability to understand various types of over voltages in power system. Ability to measure over voltages.				✓					
		CO4	Ability to test power apparatus and insulation coordination		✓							
22153C43P	SOLID STATE	CO1	Ability to understand and suggest a converter for solid state drive.				√					
22133C43F	DRIVES	CO2	Ability to select suitability drive for the given application.				✓					

		CO3	Ability to study about the steady state operation and transient dynamics of a motor load system. Ability to analyze the operation of the converter/chopper fed dc drive.			✓				
		CO4	Ability to analyze the operation and performance of AC motor drives.					√		
		CO5	Ability to analyze and design the current and speed controllers for a closed loop solid				√			
		CO1	Basic knowledge in Power system planning, operation and modeling of large scale power systems.	✓						
22153E44DP	MODELING AND SIMULATION OF SOLAR ENERGY SYSTEMS	CO2	Ability to understand the various faults occurring in power system and to solve load flow problems using numerical methods.					√		
		CO3	Ability to analyze the power system transients and faults and select the rating for protective devices.				√			
22153L45P	CONTROL AND INSTRUMENT ATION LABORATORY	CO1	Ability to understand and apply basic science, circuit theory, Electro-magnetic field theory control theory and apply them to electrical engineering problems.							

	POWER SYSTEM ANALYSIS	CO1	Ability to model the power system under steady state operating condition Ability to understand and apply iterative techniques for power flow analysis Ability to model and carry out short circuit studies on power system		✓						
22153C51P		CO2	Ability to model and analyze stability problems in power system		√						
		CO1	Ability to understand and analyze power system operation, stability, control and protection.			✓					
22153C52P	POWER QUALITY	CO2	The students able to understand the over voltage protection & analysis tools used for analyzing the transients.					√			
		CO3	They are fully trained in designing and evaluating the devices of harmonic distortion						√		
		CO1	Ability to analyze and design controllers for special Electrical Machines.							√	
		CO2	Ability to acquire the knowledge on construction and operation of stepper motor.	✓							
	SPECIAL	CO3	Ability to acquire the knowledge on construction and operation of stepper switched reluctance motors.			✓					
22153C53P	ELECTRICAL MACHINES	CO4	Ability to construction, principle of operation, switched reluctance motors.		√						

		CO1	Play a important role in transferring a healthy environment for future generations						√			
22153E54A	ENVIRONMENTA L SCIENCE AND	CO2	Analyze the impact of engineering solutions in a global and societal context					√				
1	ENGINEERING	CO3	Discuss contemporary issues that results in environmental degradation and would attempt to provide solutions to overcome those problems				√					
		CO1	Ability to practice and understand converter and inverter circuits and apply software for engineering problems.	√								
22153L55P	POWER ELECTRONICS	CO2	Ability to analyze about AC to DC converter circuits.								✓	
22133L33P	AND DRIVES	CO3	Ability to analyze about DC to AC circuits.									✓
	LAB	CO4	Ability to acquire knowledge on AC to AC converters								√	
		CO5	Ability to acquire knowledge on simulation software							√		
		CO1	To understand the main aspects of generation, utilization and conservation.						√			
22153C61P	UTILIZATION OF ELECTRICAL ENERGY	CO2	To identify an appropriate method of heating for any particular industrial application.					✓				
		CO3	To evaluate domestic wiring connection and debug any faults occurred.		✓							

		CO4	To construct an electric connection for any domestic appliance like refrigerator as well as to design a battery charging circuit for a specific household application.			✓				
		CO1	Ability to suggest suitability circuit breaker.		✓					
22153C62P	SOLID STATE RELAYS	CO2	Ability to find the causes of abnormal operating conditions of the apparatus and system			√				
		CO1	Ability to understand the day-to-day operation of electric power system.			✓				
22153C63P	POWER SYSTEM OPERATION AND CONTROL	CO2	Ability to analyze the control actions to be implemented on the system to meet the minute- to-minute variation of system demand.			✓				
		CO3	Ability to understand the reactive power-voltage interaction.					✓		
		CO1	Basic Knowledge on management, business, organization culture, environment and planning process.				√			
22153E64AP	PRINCIPLES OF MANAGEMENT	CO2	Ability to organize business activities, motivational techniques and effective communication.	√						
		CO3	Ability to understand the management control and budgetary techniques.					√		
22153L65P	POWER SYSTEMS LAB	CO1	Ability to understand power system planning and operational studies.				✓			

		CO2	Ability to acquire knowledge on Formation of Bus Admittance and Impedance Matrices and Solution of Networks.				/						
		CO3			✓								
		CO4	Ability to analyze the power flow using GS and NR method		✓								
		CO5	Ability to find Symmetric and Unsymmetrical fault			√							
		CO1	ability to have clear understanding of managerial						√				
22160S71P	TOTAL QUALITY MANAGEMENT	CO2	basic knowledge on international aspect of management								√		
		CO1	Ability to understand basics of design considerations for rotating and static electrical machines									√	
		CO2	Ability to design of field system for its application.	✓									
		CO3	Ability to design sing and three phase transformer.			✓							
22153C72P	ELECTRICAL MACHINE DESIGN	CO4	Ability to design armature and field of DC machines.		√								
22152052	POWER	CO1	Ability to create awareness about renewable Energy Sources and technologies.							√			
22153C73 P	PLANT ENGINEERING	CO2	Ability to get adequate inputs on a variety of issues in harnessing renewable Energy.						✓				
		CO3	Ability to recognize current and possible future role of renewable energy sources.					✓					

		CO1	Basic knowledge of HVDC Transmission, its components, types and applications	✓						
		CO2	Ability to analyze and design the Converter circuits, System Control Techniques						✓	
	EHV AC and DC Transmission	CO3	Ability to design filters for harmonic control and perform power flow analysis using Per unit system for DC Quantities.							✓
22153E74BP	systems	CO4							✓	
22153P75P	PROJECT WORK	CO1	O The students will be able to appreciate the importance of optimization, commercialization, and innovation as the desired features of the designed system					✓		

MTECH PS -FULL TIME 2022

COURSE CODE	COURSE TITLE	СО	COURSE OUTCOMES				√			
22240611	APPLIED MATHEMATICS	CO1	Understand Finite differences, interpolation techniques, Numerical differentiation and Integration and apply it to various practical problems		√					
22248S11 D	FOR POWER SYSTEM ENGINEERING	CO2	Apply Numerical methods to solve first order ordinary differential equations and Algebraic and Transcendental equations				√			
		соз	Illustrate Laplace transform and its application in different fields				✓			

		CO4	Apply Fourier transforms and its applications to solve Ordinary and Partial differential equations				✓				
		CO5	Use Z-transform and its applications to solve difference equations						✓		
		CO1	Basics of linear theory/linear algebra					✓			
22272C12	SYSTEM	CO2	State-space models, Transition matrix properties, Minimal realization, Controllability, Observability.	✓							
2272012	THEORY	CO3	Internal Stability, Lyapunov Stability theorems for linear systems, Linear Feedback and Observers, Separation Principle.						✓		
22272C13	ADVANCED	CO1	Ability to apply the concepts of sparse matrix for large scale power system analysis					✓			
22272C13	POWER SYSTEM ANALYSIS	CO2	Ability to analyze power system studies that needed for the transmission system planning			√					
	ECONOMIC	CO1	This course also introduces optimization methods and their application in practical power system operation problems.		√						
22272C14	OPERATIONS OF POWER SYSTEMS	CO2	This course provides application of modern numerical techniques and analytical methods for dealing with and solving operation-related problems in electric power systems.		√						

		СОЗ	The primary objective of this course is to analyze efficient and optimum operation of electric power generation system and to provide an overview about the control techniques adopted to ensure the economic operation of a power system.			>						
		CO1	Learners will be able to refresh on basics of power transmission networks and need for FACTS controllers					>				
22272C15	HVDC AND FACTS	CO2	Learners will understand the significance about different voltage source converter based FACTS controllers							√		
	FACIS	CO3	Learners will understand the significance of HVDC converters and HVDC system control								✓	
		CO4	Learners will attain knowledge on AC/DC power flow analysis	√								
		CO1	Analyze various single phase and three phase power converters			√						
22272E16 A	ANALYSIS OF INVERTERS	CO2	Select and design dc-dc converter topologies for a broad range of power conversion applications.		√							
A	HVVENTEND	CO3	Develop improved power converters for any stringent application requirements.						√			
		CO4	Design ac-ac converters for variable frequency applications.					√				

		CO1	Upon Completion of the course, the students will be able to:				·						
22272L17	POWER SYSTEM SIMULATION LABORATORY	CO2	Analyze the power flow using Newton-Raphson method and Fast decoupled method.	√									
	LABORATORT	CO3	Perform contingency analysis & economic dispatch									√	
		CO4	Set Digital Over Current Relay and Coordinate Relay										✓
22272C21	EHV POWER TRANSMISSION	CO1	Students would be introduced to the issues in designing power transmission lines operating at EHV/UHV voltages especially about insulation design, corona losses, audible noise, insulation co-ordination, electric field under the lines, issues due to mechanical vibrations of overhead power transmission lines and their mitigation etc.									~	
		CO1	Formation of Y bus, Z bus, line parameters and modeling of transmission lines.								√		
22272C22	POWER SYSTEM CONTROL	CO2	Power flow analysis: Gauss – Seidel Method.							✓			
	ADVANCED	CO1	Learners will be able to understand the various schemes available in Transformer						✓				
22272C23	POWER SYSTEM	CO2	protection		√								
	PROTECTION	CO3	Learners will have knowledge on Overcurrent protection.				·	′			 		

		CO4	Learners will attain knowledge about Distance and Carrier protection in transmission lines.		✓						
		CO5	Learners will understand the concepts of Generator protection.				√				
		CO6	Learners will attain basic knowledge on substation automation.				✓				
		CO1	Students will develop the ability to learn about load forecasting.				√				
		CO2	Students will learn about reliability analysis of ISO and interconnected systems.						✓		
22272E24 C	POWER SYSTEM RELIABILITY	СОЗ	Students will understand the concepts ot Contingency analysis and Probabilistic Load flow Analysis					√			
		CO4	Students will be able to understand the concepts of Expansion planning	√							
		CO5	Students will have knowledge on the fundamental concepts of the Distribution system planning						✓		
22272525	WIND ENERGY	CO1	Explain the basics of solar energy conversion systems.					√			
22272E25 A	CONVERSION	CO2	Design a standalone PV system.			✓					
11	SYSTEMS	CO3	Describe different wind energy conversion systems.		✓						

22272L26	ADVANCED POWER SYSTEM SIMULATION	CO1	To analyze the effect of FACTS controllers by performing steady state analysis.		√						
	LABORATORY	CO2	To have hands on experience on different wind energy conversion technologies			✓					
		CO1	A quantitative foundation of the mechanism of lighting strokes and the production of lighting surges to understand how the various types of Transients in the system produced.					~			
22272C31	ELECTRICAL TRANSIENTS IN POWER	CO2	Obtain the theoretic basis of the propagation, reflection and refraction of travelling waves for modeling of transmission line travelling waves						√		
	SYSTEMS	CO3	Grasp the concepts of the impact of voltage transients caused by circuit breaker action, switching on integrated power system.							√	
		CO4	Design of Insulations under the presence of transients and protection of power system against transient over voltages.	√							
22272E32D	ELECTROMAGNETI C INTERFERENCE AND	CO1	Recognize the sources of Conducted and radiated EMI in Power Electronic Converters and consumer appliances and suggest remedial measures to mitigate the problems			✓					
	COMPATIBILITY	CO2	Assess the insertion loss and design EMI filters to reduce the loss		✓						

		СОЗ	Design EMI filters, common-mode chokes and RC-snubber circuits measures to keep the interference within tolerable limits					✓			
		CO1	Reliably identify the sources of various power quality problems.				✓				
		CO2	Explain about causes of harmonic and its distortion effect.			√					
22272E33A	POWER CONDITIONING	СОЗ	Estimate the impact of various power quality problems on appliances.	✓							
		CO4	Educate the harmful effects of poor power quality and harmonics.							√	
		CO5	Decide the compensators and filters to keep the power quality indices within the standards.								✓
22272E34	SOFTWARE FOR CONTROL	CO1	Used for problem-solving and control system design							√	
A	SYSTEM DESIGN	CO2	Used for modeling plant dynamics, designing control algorithms, and running closed-loop simulations						✓		
22272P35	PROJECT WORK PHASE-I	CO1	On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.					√			
22272P41	PROJECT WORK PHASE- II	CO1	On Completion of the project work students will be in a position to take up any challenging practical problems and find				✓				

solution by formulating proper methodology.						

MTECH PS- PART TIME 2022

COURSE CODE	COURSE TITLE	СО	COURSE OUTCOMES				√				
		CO1	Understand Finite differences, interpolation techniques, Numerical differentiation and Integration and apply it to various practical problems				√				
22248S11D	APPLIED MATHEMATICS	CO2	Apply Numerical methods to solve first order ordinary differential equations and Algebraic and Transcendental equations						√		
P	FOR POWER SYSTEM ENGINEERING	СОЗ	Illustrate Laplace transform and its application in different fields					√			
		CO4	Apply Fourier transforms and its applications to solve Ordinary and Partial differential equations	√							
		CO5	Use Z-transform and its applications to solve difference equations						√		
		CO1	Basics of linear theory/linear algebra					✓			
22272C12 P	SYSTEM THEORY	CO2	State-space models, Transition matrix properties, Minimal realization, Controllability, Observability.			√					

		CO3	Internal Stability, Lyapunov Stability theorems for linear systems, Linear Feedback and Observers, Separation Principle.		√						
22272C13P	ADVANCED POWER	CO1	Ability to apply the concepts of sparse matrix for large scale power system analysis		>						
22272C131	SYSTEM ANALYSIS	CO2	Ability to analyze power system studies that needed for the transmission system planning			√					
		CO1	Upon Completion of the course, the students will be able to:					√			
22272L14P	POWER SYSTEM SIMULATION	CO2	Analyze the power flow using Newton-Raphson method and Fast decoupled method.						√		
	LABORATORY	CO3	Perform contingency analysis & economic dispatch							✓	
		CO4	Set Digital Over Current Relay and Coordinate Relay	√							
22272C21 P	EHV POWER TRANSMISSION	CO1	Students would be introduced to the issues in designing power transmission lines operating at EHV/UHV voltages especially about insulation design, corona losses, audible noise, insulation co-ordination, electric field under the lines, issues due to mechanical vibrations of overhead power transmission lines and their mitigation etc.			~					
22272C22P		CO1	Learners will be able to understand the various schemes available in Transformer		√						

		CO2	protection						✓			
		CO3	Learners will have knowledge on Overcurrent protection.					✓				
	ADVANCED POWER SYSTEM PROTECTION	CO4	Learners will attain knowledge about Distance and Carrier protection in transmission lines.				√					
		CO5	Learners will understand the concepts of Generator protection.	✓								
		CO6	Learners will attain basic knowledge on substation automation.								√	
		CO1	Analyze various single phase and three phase power converters									√
22272E23A	ANALYSIS AND DESIGN OF	CO2	Select and design dc-dc converter topologies for a broad range of power conversion								√	
P	POWER CONVERTERS	CO3	Develop improved power converters for any stringent application requirements.							✓		
		CO4	Design ac-ac converters for variable frequency applications.						✓			
		CO5						✓				
	ECONOMIC	CO1	This course also introduces optimization methods and their application in practical power system operation problems.		√							
22272C31 P	OPERATIONS OF POWER SYSTEMS	CO2	This course provides application of modern numerical techniques and analytical methods for dealing with and solving operation-related problems in electric power systems.				✓					

		СОЗ	The primary objective of this course is to analyze efficient and optimum operation of electric power generation system and to provide an overview about the control techniques adopted to ensure the economic operation of a power system.		√					
22272C32P		CO1	Learners will be able to refresh on basics of power transmission networks and need for FACTS controllers			✓				
	HVDC AND FACTS	CO2	Learners will understand the significance about different voltage source converter based FACTS controllers			✓				
	FACIS	CO3	Learners will understand the significance of HVDC converters and HVDC system control			✓				
		CO4	Learners will attain knowledge on AC/DC power flow analysis					√		
		CO1	Students will develop the ability to learn about load forecasting.				✓			
22272E33C P	POWER SYSTEM	CO2	Students will learn about reliability analysis of ISO and interconnected systems.	✓						
	RELIABILITY	CO3	Students will understand the concepts ot Contingency analysis and Probabilistic Load flow Analysis					*		
		CO4	Students will be able to understand the concepts of Expansion planning				✓			

		CO5	Students will have knowledge on the fundamental concepts of the Distribution system planning				√				
222521245	ADVANCED POWER	CO1	To analyze the effect of FACTS controllers by performing steady state analysis.		√						
22272L34P	SYSTEM SIMULATION LABORATORY	CO2	To have hands on experience on different wind energy conversion technologies								
22272C41		CO1	Formation of Y bus, Z bus, line parameters and modeling of transmission lines.			✓					
P	POWER SYSTEM CONTROL	CO2	Power flow analysis: Gauss – Seidel Method.					√			
		CO1	A quantitative foundation of the mechanism of lighting strokes and the production of lighting surges to understand how the various types of Transients in the system produced.						√		
22272C42 P	ELECTRICAL TRANSIENTS IN POWER	CO2	Obtain the theoretic basis of the propagation, reflection and refraction of travelling waves for modeling of transmission line travelling waves								
	SYSTEMS	CO3	Grasp the concepts of the impact of voltage transients caused by circuit breaker action, switching on integrated power system.	✓							
		CO4	Design of Insulations under the presence of transients and protection of power system against transient over voltages.			√					

22272E33C P		CO1	Students will develop the ability to learn about load forecasting.		✓								
	С	CO2	Students will learn about reliability analysis of ISO and interconnected systems.						√				
	POWER SYSTEM RELIABILITY	CO3	Students will understand the concepts ot Contingency analysis and Probabilistic Load flow Analysis					✓	<i>y</i>				
		CO4	Students will be able to understand the concepts of Expansion planning				✓						
		CO5	Students will have knowledge on the fundamental concepts of the Distribution system planning	√									
22272P44 P	PROJECT WORK PHASE-I	CO1	On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.									✓	
222725424	WIND ENERGY	CO1	Explain the basics of solar energy conversion systems.										✓
22272E43A P	CONVERSION	CO2	Design a standalone PV system.									✓	
1	SYSTEMS	CO3	Describe different wind energy conversion systems.								✓		
22272E51D P	ELECTROMAGNETI C INTERFERENCE AND COMPATIBILITY	CO1	Recognize the sources of Conducted and radiated EMI in Power Electronic Converters and consumer appliances and suggest remedial measures to mitigate the problems						✓				
		CO2	Assess the insertion loss and design EMI filters to reduce the loss					✓					

		CO3	Design EMI filters, common-mode chokes and RC-snubber circuits measures to keep the interference within tolerable limits		√								
22275E52A P		CO1	Reliably identify the sources of various power quality problems.					√					
		CO2	Explain about causes of harmonic and its distortion effect.			✓							
	POWER CONDITIONING	CO3	Estimate the impact of various power quality problems on appliances.					√					
	CONDITIONING	CO4	Educate the harmful effects of poor power quality and harmonics.					√					
		CO5	Decide the compensators and filters to keep the power quality indices within the standards.					√					
22272E53A	SOFTWARE FOR CONTROL	CO1	Used for problem-solving and control system design								✓		
P	FOR CONTROL SYSTEM DESIGN	CO2	Used for modeling plant dynamics, designing control algorithms, and running closed-loop simulations							√			
22272P61 P	PROJECT WORK PHASE- II	CO1	On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.	√									