



SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

B.TECH - FULL TIME (UG - 2022)

COURSE CODE	COURSE TITLE	CO	COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
22148S11P	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	CO1	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave 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.									✓				

		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										✓			
22153C15P	ELECTRICAL MACHINES – I	CO1	Ability to analyze the magnetic-circuits.												✓	
		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.											✓		
		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							✓						
22148S21P	NUMERICAL METHODS	CO1	Understand the basic concepts and techniques of solving algebraic equations.							✓						
		CO2	Appreciate the numerical techniques of interpolation and error approximations in various intervals in real life situations.		✓											
		CO3	Apply the numerical techniques of differentiation and integration for engineering problems.							✓						

22153C41P	PROTECTION AND SWITCHGEAR	CO1	Ability to understand and analyze Electromagnetic and Static Relays.											✓		
		CO2	Ability to suggest suitability circuit breaker.													✓
		CO3	Ability to find the causes of abnormal operating conditions of the apparatus and system.												✓	
		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.								✓					
22153C42P	HIGH VOLTAGE DC TRANSMISSION	CO1	Ability to understand Generation and measurement of high voltage.							✓						
		CO2	Ability to understand High voltage testing.		✓											
		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 DRIVES	CO1	Ability to understand and suggest a converter for solid state drive.							✓						
		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								✓							
22153E44DP	MODELING AND SIMULATION OF SOLAR ENERGY SYSTEMS	CO1	Basic knowledge in Power system planning, operation and modeling of large scale power 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 INSTRUMENTATION LABORATORY	CO1	Ability to understand and apply basic science, circuit theory, Electro-magnetic field theory control theory and apply them to electrical engineering problems.						✓									

		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.							✓							
22153C62P	SOLID STATE RELAYS	CO1	Ability to suggest suitability circuit breaker.			✓											
		CO2	Ability to find the causes of abnormal operating conditions of the apparatus and system							✓							
22153C63P	POWER SYSTEM OPERATION AND CONTROL	CO1	Ability to understand the day-to-day operation of electric power system.							✓							
		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.										✓				
22153E64AP	PRINCIPLES OF MANAGEMENT	CO1	Basic Knowledge on management, business, organization culture, environment and planning process.									✓					
		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.									✓					

22153E74BP	EHV AC and DC Transmission systems	CO1	Basic knowledge of HVDC Transmission, its components, types and applications	✓													
		CO2	Ability to analyze and design the Converter circuits, System Control Techniques											✓			
		CO3	Ability to design filters for harmonic control and perform power flow analysis using Per unit system for DC Quantities.													✓	
		CO4												✓			
22153P75P	PROJECT WORK	CO1	<ul style="list-style-type: none"> ○ 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	CO	COURSE OUTCOMES						✓							
22248S11 D	APPLIED MATHEMATICS FOR POWER SYSTEM ENGINEERING	CO1	Understand Finite differences, interpolation techniques, Numerical differentiation and Integration and apply it to various practical problems			✓										
		CO2	Apply Numerical methods to solve first order ordinary differential equations and Algebraic and Transcendental equations						✓							
		CO3	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									✓					
22272C12	SYSTEM THEORY	CO1	Basics of linear theory/linear algebra								✓						
		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.											✓			
22272C13	ADVANCED POWER SYSTEM ANALYSIS	CO1	Ability to apply the concepts of sparse matrix for large scale power system analysis								✓						
		CO2	Ability to analyze power system studies that needed for the transmission system planning					✓									
22272C14	ECONOMIC OPERATIONS OF POWER SYSTEMS	CO1	This course also introduces optimization methods and their application in practical power system operation problems.			✓											
		CO2	This course provides application of modern numerical techniques and analytical methods for dealing with and solving operation-related problems in electric power systems.							✓							

		CO3	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.				✓								
22272C15	HVDC AND FACTS	CO1	Learners will be able to refresh on basics of power transmission networks and need for FACTS controllers						✓						
		CO2	Learners will understand the significance about different voltage source converter based FACTS controllers								✓				
		CO3	Learners will understand the significance of HVDC converters and HVDC system control											✓	
		CO4	Learners will attain knowledge on AC/DC power flow analysis		✓										
22272E16 A	ANALYSIS OF INVERTERS	CO1	Analyze various single phase and three phase power converters				✓								
		CO2	Select and design dc-dc converter topologies for a broad range of power conversion applications.			✓									
		CO3	Develop improved power converters for any stringent application requirements.							✓					
		CO4	Design ac-ac converters for variable frequency applications.						✓						

		CO3	Design EMI filters, common-mode chokes and RC-snubber circuits measures to keep the interference within tolerable limits								✓					
22272E33A	POWER CONDITIONING	CO1	Reliably identify the sources of various power quality problems.							✓						
		CO2	Explain about causes of harmonic and its distortion effect.						✓							
		CO3	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 A	SOFTWARE FOR CONTROL SYSTEM DESIGN	CO1	Used for problem-solving and control 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	CO	COURSE OUTCOMES												
22248S11D P	APPLIED MATHEMATICS FOR POWER SYSTEM ENGINEERING	CO1	Understand Finite differences, interpolation techniques, Numerical differentiation and Integration and apply it to various practical problems						✓						
		CO2	Apply Numerical methods to solve first order ordinary differential equations and Algebraic and Transcendental equations						✓						
		CO3	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									✓			
22272C12 P	SYSTEM THEORY	CO1	Basics of linear theory/linear algebra								✓				
		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 SYSTEM ANALYSIS	CO1	Ability to apply the concepts of sparse matrix for large scale power system analysis			✓									
		CO2	Ability to analyze power system studies that needed for the transmission system planning				✓								
22272L14P	POWER SYSTEM SIMULATION LABORATORY	CO1	Upon Completion of the course, the students will be able to:						✓						
		CO2	Analyze the power flow using Newton-Raphson method and Fast decoupled method.								✓				
		CO3	Perform contingency analysis & economic dispatch											✓	
		CO4	Set Digital Over Current Relay and Coordinate Relay		✓										
22272C21P	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			✓									

	ADVANCED POWER SYSTEM PROTECTION	C02	protection								✓					
		C03	Learners will have knowledge on Overcurrent protection.								✓					
		C04	Learners will attain knowledge about Distance and Carrier protection in transmission lines.							✓						
		C05	Learners will understand the concepts of Generator protection.	✓												
		C06	Learners will attain basic knowledge on substation automation.											✓		
22272E23A P	ANALYSIS AND DESIGN OF POWER CONVERTERS	C01	Analyze various single phase and three phase power converters												✓	
		C02	Select and design dc-dc converter topologies for a broad range of power conversion											✓		
		C03	Develop improved power converters for any stringent application requirements.											✓		
		C04	Design ac-ac converters for variable frequency applications.									✓				
		C05									✓					
22272C31 P	ECONOMIC OPERATIONS OF POWER SYSTEMS	C01	This course also introduces optimization methods and their application in practical power system operation problems.		✓											
		C02	This course provides application of modern numerical techniques and analytical methods for dealing with and solving operation-related problems in electric power systems.								✓					

