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MIC College of Technology

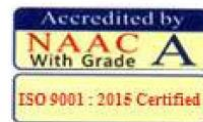
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Kanchikacherla-521180, NTR Dist, A.P, India.

Tel.No : 08678-273535/9491457799/7382616824

Website : www.mictech.edu.in



DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE OUTCOMES MIC18

I SEMESTER(I BTECH -I SEM)

18EE1T01	ENGLISH - I
CO 1	Use English language, both written and spoken, competently and correctly.
CO 2	Improve comprehension and fluency of speech
CO 3	Gain confidence in using English in verbal situations.
CO 4	Hone the communication skills to meet the challenges of their careers very successfully.
CO 5	Strengthen communication skills in different contexts like formal and informal.
18EE1T02	LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS
CO 1	Apply the knowledge to solve a system of homogeneous and non-homogeneous linear equations
CO 2	Optimize functions of several variables and able to find extreme values of constrained functions
CO 3	Able to analyze the real life situations, formulate the differential equations and then applying the methods
CO 4	Apply the knowledge to solve the linear differential equations
CO 5	Provide the techniques of Laplace transformations and able to solve problems related to digital signal processing
18EE1T03	APPLIED CHEMISTRY
CO 1	Study of polymers and composite materials enable us to use them in a good number of engineering fields
CO 2	Electrochemical principles from the basis of batteries that are being developed. Destruction of metals and alloys can be prevented by understanding the science of corrosion
CO 3	Methods of purification of water can be known so that more of them can be developed
CO 4	industries are run by the quality of fuels and energy crisis can be met by broad understanding of different fuels
CO 5	Study of the existing developed materials forms a basis for developing more number of advanced materials and the basics of analytical techniques helps in analysing the material.
18EE1T04	PROBLEM SOLVING THROUGH C
CO 1	To formulate simple algorithms for arithmetic, logical problems and translate them to programs in c language
CO 2	To implement conditional branching, iteration and recursion.
CO 3	To decompose a problem into functions and synthesize a complete program using divide and conquer approach.
CO 4	To use arrays, pointers and structures to formulate algorithms and programs



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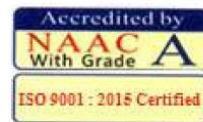
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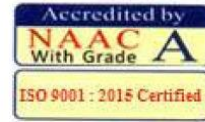


CO 5	To apply programming to solve matrix addition and multiplication problems and searching and sorting problems.
CO 6	To use structures and files
18EE1T05	ENGINEERING GRAPHICS
CO 1	Draw the polygons, ellipse, parabola, hyperbola, cycloids and involutes for various types of profiles
CO 2	Construction of various scales like plain, diagonal and Vernier scales. Draw the orthographic projections of the points, lines.
CO 3	Draw the projections of planes.
CO 4	Draw the projections of solids
CO 5	Convert Orthographic projections to isometric projection and vice versa.
18EE1L06	ENGLISH COMMUNICATION SKILLS LAB - I
CO 1	Acquire basic proficiency in English by learning functional aspects of English language
CO 2	Learn the methods of enhancing vocabulary
CO 3	Acquaint himself/herself with nuances of phonetics
18EE1L07	APPLIED CHEMISTRY LAB
CO 1	student is exposed to different methods of chemical analysis and use of some commonly employed instruments. they thus acquire some experimental skills
18EE1L08	PROBLEM SOLVING THROUGH C LAB
CO 1	Demonstrate Knowledge on various concepts of a C language.
CO 2	Able to draw flowcharts and write algorithms.
CO 3	Able design and development of C problem solving skills.
CO 4	Able to design and develop modular programming skills.
CO 5	Able to trace and debug a program
18EE1L09	FIELD PRACTICE LAB
CO 1	To select suitable tools and equipment to prepare joints using bench-work tools.
CO 2	To produce joints using materials of specific shape and size by a suitable set of operations and check the accuracy of shape and dimensions using.
II SEMESTER(I BTECH -II SEM)	
18EE2T01	ENGLISH - II
CO 1	Use English language in various contexts
CO 2	Improve comprehension and fluency of speech
CO 3	Appreciate a literary text
CO 4	Hone the communication skills to meet the challenges of their careers very successfully
CO 5	Understand the need for lifelong learning



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18EE2T02	VECTOR CALCULUS & FOURIER TRANSFORMS
CO 1	Determine the areas and volumes using multiple integration
CO 2	Interpret the divergence, gradient and curl physically
CO 3	Analyze the general periodic functions in the form of an infinite convergent sine and cosine series
CO 4	Explain the techniques of Fourier transforms
CO 5	Illustrate the methods to solve the boundary value problems
18EE2T03	APPLIED PHYSICS
CO 1	To identify different crystal structures and to study different point defects.
CO 2	To gain basic knowledge of Simple harmonic waves and study of free and forced vibrations.
CO 3	To Develop the knowledge of science of Acoustics and Ultrasonic and their applications in various fields.
CO 4	The Analytical study of response of materials to Electromagnetic fields.
CO 5	The Study of lasers and optical fibers with an emphasis of their Engineering applications.
18EE2T04	BIOLOGY FOR ENGINEERS
CO 1	Understand how biological observations lead to major discoveries and the morphological, Bio chemical and ecological classification of organisms
CO 2	Understand that all forms of life have the same building blocks and their involvement in the maintenance and metabolic processes of living organisms
CO 3	Classify enzymes and distinguish between different mechanisms of enzyme action and study the chemical reactions that are catalysed by enzymes. Apply thermodynamic principles to biological systems and able to understand major chemical process that occur with in a living organism in order to maintain life
CO 4	Identify DNA as genetic material in the molecular basis of information transfer
CO 5	Identify and classify micro organisms, Understand media compositions and growth of microorganisms
18EE2T05	POWER SYSTEMS-1
CO 1	Determine the significance of various components of the Thermal Power Stations
CO 2	Determine the significance of various components of the power generation plants
CO 3	Describe the use of solar energy and the various components used in the energy production
CO 4	Appreciate the need of Wind Energy and the various components used in energy generation and know the classifications.
CO 5	Appreciate the Economic Aspects different types of tariff.



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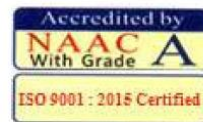
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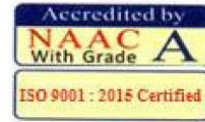
18EE2L06	ELECTRICAL CIRCUIT ANALYSIS-1
CO 1	Various electrical networks in presence of active and passive elements
CO 2	R, L, C network with sinusoidal excitation & R, L, network with variation of any one of the parameters i.e R, L, C and f.
CO 3	Electrical networks with network topology concepts.
CO 4	Any magnetic circuit with various dot conventions.
CO 5	Electrical networks by using principles of network theorems.
18EE2L07	APPLIED PHYSICS lab
CO 1	Implement the basic principles of Optics through various phenomena of light.
CO 2	Implement the basic principles of Mechanics to measure different physical parameters.
CO 3	Enhance the knowledge of Usage of electronic devices in various applications
18EE2L08	BASIC ENGINEERING & IT WORKSHOP
CO1	Identify, assemble and update the components of a computer
CO2	Configure, evaluate and select hardware platforms for the implementation and execution of computer applications, services and systems
CO3	Make use of tools for converting pdf to word and vice versa
CO4	Develop presentation, documents and small applications using productivity tools such as word processor, presentation tools, spreadsheets, HTML, LaTeX
18EE2M09	ENVIRONMENTAL SCIENCE
CO1	The importance of environment, Natural resources and current global environmental challenges for the sustenance of the life on planet earth.
CO2	The concepts of the ecosystem and its function in the environment.
CO3	The biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity
CO4	The various attributes of the pollution and their impacts and measures to reduce or control the pollution along with waste management practices.
CO5	The environmental legislations of India and Social issues and the possible means.
CO6	Environmental assessment and the stages involved in EIA.
III SEMESTER(II BTECH -I SEM)	
18EE3T01	Complex Variables and Numerical Methods
CO 1	Apply complex functions in the study of fluid mechanics, thermodynamics and electric fields
CO 2	Analyze the analytic function into a power series which is useful in the study of communication systems



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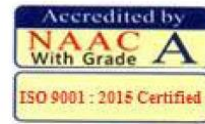
CO 3	Illustrate the techniques of the contour integration to determine the real integrals
CO 4	Determine the solution of transcendental equations by different numerical methods
CO 5	Illustrate the numerical methods to determine solutions for a class of ordinary differential equations involving irregularly shaped boundaries
18EE3T02	Electrical Circuit Analysis – II
CO 1	able to solve three- phase circuits under balanced condition
CO 2	able to solve three- phase circuits under unbalanced condition
CO 3	able find the transient response of electrical networks for different types of excitations
CO 4	able to find parameters for different types of network.
CO 5	able to realize electrical equivalent network for a given network transfer function
18EE3T03	Analog Electronics-I
CO 1	Able to assimilate the concepts of semiconductor devices
CO 2	Able to understand the the concepts of diode circuits
CO 3	Able to understand the the concepts of BJT & Configurations
CO 4	Able to analyze the performance of Field Effect Transistors
CO 5	Able to understand the the concepts of Feedback Amplifiers & Oscillators
18EE3T04	Electrical Machines – I
CO 1	Able to assimilate the concepts of electromechanical energy conversion
CO 2	Able to mitigate the ill-effects of armature reaction and improve commutation in dc machines
CO 3	Able to understand the torque production mechanism and control the speed of dc motors
CO 4	Able to analyze the performance of single phase transformers.
CO 5	Able to predetermine regulation, losses and efficiency of single phase transformers
18EE3T05	Electromagnetic Fields
CO 1	Understand the production of electric field and potentials due to different configurations of static charges
CO 2	Understand the concepts of conduction and convection current densities
CO 3	Understand the concept of magnetic field and Maxwell equations
CO 4	Calculate the magnetic force
CO 5	Understand the time varying fields
18EE3T06	Basics of Mechanical Engineering
CO 1	Understand the concepts of Heat and Work
CO 2	Understand the concept of Power Cycles and Refrigeration Cycle



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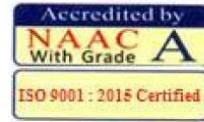
CO 3	Understand the concepts of Hydro Prime Movers & Hydro Power
CO 4	Understand the concepts of Engineering Mechanics
18EE3L07	Electrical Circuits Lab
CO 1	Able to Perform circuit Theorems
CO 2	Able to Perform Series and Parallel Resonance
CO 3	Able to Calculate Z and Y parameters
CO 4	Able to Perform parameters of a Choke coil
CO 5	Able to measure 3 phase power by two watt meter method unbalanced loads
18EE3L08	Analog Electronics Lab
CO 1	Able to Perform PN Junction diode Characteristics
CO 2	Able to Perform Zener Diode Characteristics
CO 3	Able to understand the concepts of Rectifiers
CO 4	Able to Perform BJT and FET Characteristics
CO 5	Able to perform Clippers, clampers and RC phase shift Oscillator
18EE3T09	Education Technology and Society
CO 1	Will be able to understand the need of education to human life
CO 2	Able to understand the Nature of scope of education
CO 3	able to understand role of technology in education
CO 4	able to understand the technology & society
CO 5	able to understand Ethical Values and Implications
IV SEMESTER(II BTECH -II SEM)	
18EE4T01	Analog Electronics-II
CO 1	Analyse and Design of Multivibrators using transistors
CO 2	Able to explain the operation and performance of Op-amp
CO 3	Able to analyze the Applications of Op-Amp
CO 4	Able to understand the operation of filters and timers
CO 5	Use various DAC techniques
18EE4T02	Electrical Machines – II
CO 1	Able to explain the operation and performance of three phase induction motor.
CO 2	Able to analyze the torque-speed relation, performance of induction motor and induction generator
CO 3	Able to explain design procedure for transformers and three phase induction motors.
CO 4	Implement the starting of single phase induction motors.



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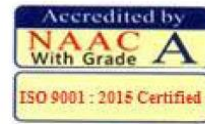
CO 5	To perform winding design and predetermine the regulation of synchronous generators
18EE4T03	Control Systems
CO 1	Understand the different Classification of control systems and modelling
CO 2	Understand the functioning of Signals & time response analys
CO 3	Understand the concept of Root Locus & Construction of Root Loci
CO 4	Understand the concept of Bode plot & Nyquist Plot
CO 5	Understand the concept of States Space Analysis of LTI System
18EE4T04	Power Systems –II
CO 1	Able to understand parameters of various types of transmission lines during different operating conditions
CO 2	Able to understand the performance of short and medium transmission lines
CO 3	Student will be able to understand travelling waves on transmission lines.
CO 4	Will be able to understand various factors related to charged transmission lines.
18EE4T05	Digital Electronics
CO 1	Learn the advantages of discrete time control systems and the “know how” of various associated accessories
CO 2	Understand z–transformations and their role in the mathematical analysis of different Systems
CO 3	The stability criterion for digital systems and methods adopted for testing the same are Explained
CO 4	Understand, the conventional and state space methods of design are also introduced
CO 5	Understand, the State Feedback Controllers
18EE4T06	Data Structures Through C
CO 1	Use various searching and sorting algorithms.
CO 2	Use basic data structures such as arrays and linked list.
CO 3	Implementation of stacks.
CO 4	Implementation of queues.
18EE4L07	Control Systems & Simulation Lab
CO 1	Analyze and design of various power system and power electronics
CO 2	Examine the transient response of RLC circuits for different inputs
CO 3	Analyze the voltage and current waveforms of power system components
18EE4L08	Electrical Machines – I Lab
CO 1	Determine and predetermine the performance of DC machines and



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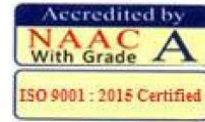
	Transformers
CO 2	Control the speed of DC motor
CO 3	Achieve three phase to two phase transformation
18EE4L09	Data Structures Through C Lab
CO1	Use basic data structures such as arrays and linked list
CO2	Programs to demonstrate fundamental algorithmic problems including Tree Traversals, Graph traversals, and shortest paths.
CO3	Use various searching and sorting algorithms
CO4	Understand and use Trees for complex operations
V SEMESTER(III BTECH -I SEM)	
18EE5T01	POWER ELECTRONICS
CO1	Explain the characteristics of various power semiconductor devices and analyze the static and dynamic characteristics of SCR's
CO2	Explain the operation of single phase & three Phase full-wave converters and analyze harmonics in the input current.
CO3	Analyze the operation of different types of DC-DC converters.
CO4	Explain the operation of inverters and application of PWM techniques for voltage control and harmonic mitigation
CO5	Analyze the operation of AC-AC regulators
18EE5T02	ELECTRICAL MEASUREMENTS
CO1	Choose right type of instrument for measurement of voltage and current current for ac and dc
CO2	Choose right type of instrument for measurement of power and energy
CO3	Use potentiometer and instrumentation transformer
CO4	Select suitable bridge for measurement of electrical parameters
CO5	Measure frequency and phase difference between signals using CRO
18EE5T03	PYTHON PROGRAMMING
CO1	Identify the type of NoSQL database to implement based on business requirements
CO2	Apply NoSQL data modeling from application specific queries
CO3	Understand NoSQL Storage Architecture
CO4	Use Atomic Aggregates and denormalization as data modeling techniques to optimize query processing
18EE5T04	EFFECTIVE TECHNICAL COMMUNICATION
CO1	Able to speak with fluent vocabulary
CO2	Able to write with proper sentence formation



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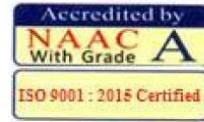
CO3	Able to identify errors in writing.
CO4	Able to communicate orally
CO5	Able to analyze different life skills
18EE5T07	QUANTATIVE APTITUDE AND REASONING
CO1	Understand the basics concepts of Numerical Ability & Reasoning Skills
CO2	Use the logical thinking and analytical abilities to solve Quantitative aptitude questions from companies specific and other competitive tests
CO3	Solve questions related to time and distance, time and work ,percentages, simple interest and compound interest etc.
CO4	Solve questions related to coding and decoding, number series, directions, puzzles ,etc.
CO5	Understand and solve puzzle related questions for competitive and campus placements exams.
18EE5L08	ELECTRICAL MACHINES -II LAB
CO1	Able to assess the performance of single phase and three phase induction motors
CO2	Able to control the speed of three phase induction motor
CO3	Able to predetermine the regulation of three–phase alternator by various methods.
CO4	Able to find the X_d/ X_q ratio of alternator and asses the performance of three–phase synchronous motor
18EE5L09	ELECTRICAL MEASUREMENTS LAB
CO1	Able to measure the electrical parameters voltage & current
CO2	Able to find electrical characteristics of resistance, inductance and capacitance
CO3	Able to calibrate different measuring instruments
CO4	Able to measure the electrical parameters power and energy.
CO5	Able to test transformer oil for its effectiveness
18EE5L10	PYTHON PROGRAMMING LAB
CO1	Identify the type of NoSQL database to implement based on business requirements
CO2	Apply NoSQL data modeling from application specific queries
CO3	Understand NoSQL Storage Architecture
CO4	Use Atomic Aggregates and denormalization as data modeling techniques to optimize query processing
CO5	Apply indexing and ordering of data sets



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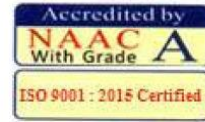
18EE5T11	CONSTITUTION OF INDIA
CO1	Importance for building a democratic India, features and principles of Indian Constitution.
CO2	The functioning of three wings of the government ie., executive, legislative and judiciary.
CO3	The roles and powers of State Government
CO4	The decentralization of power between Union, State and Local self-Government and local administration
CO5	Election Commission, UPSC, Welfare commissions for sustaining democracy
VI SEMESTER(III BTECH -II SEM)	
18EE6T01	MICROPROCESSORS AND MICROCONTROLLERS
CO1	To be able to understand the microprocessor capability in general and explore the evaluation of microprocessors.
CO2	To be able to understand the addressing modes of microprocessors
CO3	To be able to understand the micro controller capability
CO4	To be able to program microprocessor and microcontroller
CO5	To be able to interface microprocessor and microcontroller with other electronic devices
18EE6T02	SWITCHGEAR AND PROTECTION
CO1	Able to understand the principles of arc interruption for application to High voltage circuit breakers of air, oil, vacuum, SF6 gas type
CO2	Ability to understand the working principle and operation of different Types of electromagnetic protective relays.
CO3	Students acquire knowledge of faults and protective schemes for high power generator and transformers and understand various types of protective schemes
CO4	Able to understand different types of static relays and their applications
CO5	Able to understand different types of over voltages and protective schemes required for insulation co-ordination
18EE6T03	OOPS THROUGH JAVA
CO1	Implement java applications using OOP principles and proper program structuring.
CO2	Develop java programs using packages, inheritance and interfaces
CO3	Implement error and exception handling techniques.
CO4	Design event driven GUI and real-time web related applications
18EE6T04	MANAGEMENT SCIENCE
CO1	Understand the concepts related to Business
CO2	Demonstrate the roles, skills and functions of management



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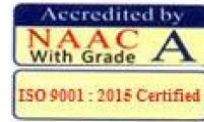
CO3	Analyze effective application of PPM knowledge to diagnose
CO4	solve organizational problems and develop optimal managerial decisions.
CO5	Understand the complexities associated with management of human resources in the organizations
18EE6T08	ENERGY AUDIT CONSERVATION AND MANAGEMENT
CO1	Explain energy efficiency, conservation and various technologies. Design energy efficient lighting systems.
CO2	Calculate power factor of systems and propose suitable compensation techniques.
CO3	Explain energy conservation in HVAC systems
CO4	Calculate life cycle costing analysis and return on investment on energy efficient technologies.
CO5	Design energy efficient lighting systems
18EE6L07	MICROPROCESSORS AND MICROCONTROLLERS LAB
CO1	To write assembly language program using 8086 microprocessor based on arithmetic, logical, and shift operations
CO2	To do modular programming using 8086 micro processor
CO3	To interface 8086 with I/O and other devices
CO4	To do serial communication using 8051 micro controllers
CO5	To interface 8051 with I/O and other devices.
18EE6L08	POWER ELECTRONICS & SIMULATION LAB
CO1	Obtain static characteristics of semiconductor devices to discuss their Performance
CO2	Trigger the SCR by different methods
CO3	Verify the performance of single phase controlled full wave rectifier and AC voltage controller with R and RL loads
CO4	Verify the performance of single phase full bridge inverter connected to resistive load
CO5	Ability to experiment about switching characteristics various switches
18EE6L09	OOPS THROUGH JAVA LAB
CO1	Understand the behavior of primitive data types, object references, and arrays.
CO2	Implement Java classes from specifications
CO3	Implement interfaces, inheritance, and polymorphism as programming techniques
CO4	Apply exceptions handling.



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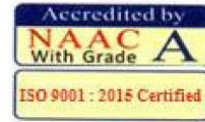
VII SEMESTER(IV BTECH -I SEM)	
18EE7T01	DIGITAL SIGNAL PROCESSING
CO1	Perform time, frequency, and Z -transform analysis on signals and systems
CO2	Understand the inter-relationship between DFT and various transforms.
CO3	Understand the significance of various filter structures and effects of round off errors
CO4	Design a digital filter for a given specification.
CO5	Understand the fast computation of DFT and appreciate the FFT processing.
18EE7T02	POWER SYSTEM OPEARTION AND CONTROL
CO1	Develop Power flow solutions using iterative techniques
CO2	Compute symmetrical and unsymmetrical fault analysis of given power system.
CO3	Perform stability analysis of a power system.
CO4	Analyse the performance of generators in thermal power station for economical operation
CO5	Analyse Load frequency control of power system.
18EE7T04	RENEWABLE ENERGY SOURCES
CO1	Know the need of various renewable energy systems
CO2	understand the concepts of bio-energy
CO3	Acquire the knowledge of OTEC, tidal
CO4	Acquire the knowledge of geothermal and Alternative energy sources
18EE7T08	SPECIAL ELECTRICAL MACHINES
CO1	Distinguish between brush dc motor and brush less dc motor
CO2	Explain the performance and control of stepper motors, and their applications
CO3	Explain theory of operation and control of switched reluctance motor.
CO4	Explain the theory of travelling magnetic field and applications of linear motors.
CO5	Understand the significance of electrical motors for traction drives.
18EE7T03	ELECTRIC VEHICLES
CO1	Assess the performance, societal and environmental impact of EHV's having known their past history
CO2	Implement various drive train topologies and control strategies in Electric and Hybrid vehicles
CO3	Recommend, Design/Size and Control different electric propulsion units and



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 Kanchikacherla-521180, NTR Dist, A.P, India.
 Tel.No : 08678-273535/9491457799/7382616824
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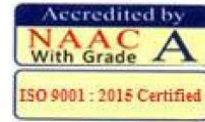
	other components of EHV's and BEV's
CO4	Appropriately select the energy storage system and strategize its management in EHV's
18EE7L09	DIGITAL SIGNAL PROCESSING LAB
CO1	Apply the difference equations concept in the analyzation of Discrete time systems
CO2	Use the FFT algorithm for solving the DFT of a given signal
CO3	Design a Digital filter (FIR&IIR) from the given specifications
CO4	Realize the FIR and IIR structures from the designed digital filter.
18EE7L10	POWER SYSTEMS & SIMULATION LAB
CO1	Students are able to determine parameters of transmission line.
CO2	Students are able to understand the concept of fault analysis of alternator.
CO3	Students are able to check the dielectric strength of transformer oil.
CO4	Students are able to write the program for analysing energy management systems functions at load dispatch centre.
VIII SEMESTER(IV BTECH -II SEM)	
18EE8T01	UTILIZATION OF ELECTRICAL ENERGY
CO1	Student should be able to identify a suitable motor for electric drives and industrial applications
CO2	Student should able to identify most appropriate heating or welding techniques for suitable applications
CO3	Student should able to understand various level of luminosity produced by different illuminating sources.
CO4	Student should able to estimate the illumination levels produced by various sources and recommend the most efficient illuminating sources and should be able to design different lighting systems by taking inputs and constraints in view.
CO5	Student should able to determine the speed/time characteristics of different types of traction motors and estimate energy consumption levels
18EE8T02	POWER ELECTRONIC CONTROL OF ELECTRIC DRIVES
CO1	Identify different electric drive system
CO2	Understand the operation of rectifier fed DC drives, chopper fed DC drives and closed loop control of DC motor
CO3	Analyse the slip power recovery schemes of Induction motor and speed control of converter fed induction motor & synchronous motor.



DVR & Dr. HS
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CO4	Evaluate the performance of speed control of synchronous motor by CSI and VSI
18EE8T05	HVDC & FACTS
CO1	To Understand basic concepts of HVDC Transmission
CO2	Analyze the converter configuration and the operation of converters.
CO3	The control of converter and HVDC Transmission.
CO4	Analyze the basic concepts of FACTS.
CO5	To learn the operation of different FACTS devices
18EE8T10	POWER QUALITY
CO1	Differentiate between different types of power quality problems.
CO2	Explain the sources of voltage sag, voltage swell, interruptions, transients, long duration over voltages and harmonics in a power System.
CO3	Analyze power quality terms and power quality standards
CO4	Explain the principle of voltage regulation and power factor improvement methods
CO5	Explain the power quality monitoring concepts and the usage of measuring Instruments