

Priyadarshini College of Engineering, Nagpur

Department of Electrical Engineering

Sem: Third(EE) Course Code : BTCHEE302T Course Name : Network Analysis

Student will be able to

CO	CO Statement	BT Level
CO1	Analyze electrical circuits using mesh and node analysis methods	3
CO2	Apply network theorems for the electrical circuits.	3
CO3	Obtain transient and steady-state responses of electrical circuits.	3
CO4	Application of Laplace transforms for waveforms synthesis.	3
CO5	Evaluate behaviour of two port network functions	3

Sem: Third(EE) Course Code : BTCHEE303T Course Name : Electrical Measurement & Instrumentation

Student will be able to

CO	CO Statement	BT Level
CO1	Classify various instruments to measure electrical quantities	3
CO2	Apply method for measurement of resistance, capacitance and inductance	3
CO3	Measure power of 3-phase circuits and energy of 1-phase circuits using various methods	3
CO4	Select the suitable current and potential transformers	3
CO5	Measure and analyze the physical quantities using analog transducers and digital transducers	3

Sem: Third(EE) Course Code : BTCHEE304T Course Name : Analog Devices & Circuits

Student will be able to

CO	CO Statement	BT Level
CO1	Investigate various types of diodes and rectifier circuits	3
CO2	Illustrate the characteristics and use of a transistor for various applications.	3
CO3	Apply the knowledge of transistor as power amplifiers and oscillators circuits .	3
CO4	Discuss differential amplifier and their operating modes	3
CO5	Apply OP-AMPs for various applications in electronics circuits	3

Sem: Third(EE) Course Code : BTCHEE305T Course Name : Renewable Energy Sources

Student will be able to

CO	CO Statement	BT Level
CO1	Analyse solar radiation geometry	3
CO2	Apply Solar photovoltaic system for generation of power.	3
CO3	Describe various applications of Solar Energy.	3
CO4	Outline the site requirement criteria for wind farms & compare different types of wind energy conversion system.	3
CO5	Discuss various renewable energy sources for generating Electricity. (limited to Geothermal, MHD, Biomass, Fuel cell, Tidal, Ocean)	3

Sem: Third(EE) Course Code : BTCHEE306T Course Name : Introduction to Python Programming

Student will be able to

CO	CO Statement	BT Level
CO1	Identify different operators and variables.	2
CO2	Discuss Strings, List, Tuples, Dictionary and Sets.	3
CO3	Illustrate functions, loops and modules in Python programming.	3

Sem: Fourth(EE) Course Code : BTCHEE401T Course Name : Signal and Systems

Student will be able to

CO	CO Statement	BT Level
CO1	Discuss the basics of signal space theory	3
CO2	Determine the concepts of state space representation	3
CO3	Describe convolution sum of two signals	3
CO4	Analyse DFT, DTFT and z transform	4
CO5	Discuss the concept of sampling and reconstruction	3

Sem: Fourth(EE) Course Code : BTCHEE402T Course Name : Digital Electronics

Student will be able to

CO	CO Statement	BT Level
CO1	Perform conversion between number systems, apply boolean algebra on logic functions and implement digital circuits.	3
CO2	Analyse and implement combinational digital circuits	4
CO3	Design and implement sequential logic circuits for specific applications	4
CO4	Discuss various Analog-Digital conversion techniques.	3
CO5	Describe semiconductor memories and implement given logical expression with programmable logic devices.	3

Sem: Fourth(EE) Course Code : BTCHEE403T Course Name : Electrical Machines-I

Student will be able to

CO	CO Statement	BT Level
CO1	Determine the performance of Transformer with various parameters.	3
CO2	Describe the working of D.C. Machine	3
CO3	Compare different types of Three Phase Induction Motor	3
CO4	Illustrate various parameters of Synchronous Machines	3
CO5	Describe Single Phase Machines and Special Machines.	3

Sem: Fourth(EE) Course Code : BTCHEE404T Course Name : Power System

Student will be able to

CO	CO Statement	BT Level
CO1	Describe the Structure of electrical power system, smart grid, microgrid & Substation.	3
CO2	Represent power system elements in per unit system.	3
CO3	Illustration of transmission line and cables parameters	3
CO4	Evaluate the performance of transmission lines.	4
CO5	Describe the method of load flow analysis and the concept of voltage stability.	3

Sem: Fourth(EE) Course Code : BTCHEE405T Course Name : Electromagnetic field

Student will be able to

CO	CO Statement	BT Level
CO1	Recognize and apply the knowledge of different co-ordinate systems.	3
CO2	Evaluate the physical quantities of electromagnetic fields in different media and apply Gauss law.	3
CO3	Describe static electric fields boundary conditions, nature of dielectric materials and evaluate potential fields.	3
CO4	Discuss steady magnetic fields, their behavior in different media, associated laws and inductance.	3
CO5	Analyze Maxwell's equations in different forms and different media	3

Sem: Fourth(EE) Course Code : BTCHEE406T Course Name : Simulation and Programming Techniques

Student will be able to

CO	CO Statement	BT Level
CO1	Develop the programs using program control statement and functions.	3
CO2	Develop the programs using array, structure and pointer.	3
CO3	Discuss the basics of C++	3
CO4	Develop the programs using conditional and iterative statement in MATLAB and display data using graphical tools.	3
CO5	Apply knowledge of MATLAB, Toolboxes and Simulink to solve matrix operations, plot graphs, build and analyze simple electrical circuits.	3

Sem: Fifth(EE) Course Code : BTCHEE501T Course Name : Microprocessor & Microcontroller

Student will be able to

CO	CO Statement	BT Level
CO1	Discuss the architecture of microprocessor	3
CO2	Illustrate the concept of memory organization, stack memory and assembly language programming	3
CO3	Describe different interrupt technique and interfacing with 8085 microprocessor	4
CO4	Discuss the Architecture of 8051 instruction set with programming	3
CO5	Interface various Hardware with microcontroller 8051	3

Sem: Fifth(EE) Course Code : BTCHEE502T Course Name : Control System

Student will be able to

CO	CO Statement	BT Level
CO1	Model the linear systems through classical approach.	3
CO2	Discuss the time response and specifications for different controllers.	3
CO3	Analyse the absolute stability and the relative stability through the root locus method.	4
CO4	Determine the stability of system using frequency response techniques.	3
CO5	Discuss the state-space models for continuous and discrete data systems	3

Sem: Fifth(EE) Course Code : BTCHEE503T Course Name : Power Electronics

Student will be able to

CO	CO Statement	BT Level
CO1	Illustrate the characteristics of UJT, SCR and its protection	3
CO2	Discuss the working of static controllable switches and commutation	3
CO3	Describe line commutated single and three phase-controlled converters	3
CO4	Discuss the working of single and three phase inverter circuits and cycloconverter	3
CO5	Design the dc-to-dc converter and its application in power system and electrical vehicle	4

Sem: Fifth(EE) Course Code : BTCHEE504T Course Name : Advanced Electrical Power System

Student will be able to

CO	CO Statement	BT Level
CO1	Apply symmetrical components concepts in fault analysis	3
CO2	Evaluate fault currents for different types of faults	4
CO3	Deduce the power system stability.	4
CO4	Obtain economic operation of power system	3
CO5	Demonstrate method to control the voltage, frequency and Power flow	3

Sem: Fifth(EE) Course Code : BTCHEE505T Course Name : Power Station Practice

Student will be able to

CO	CO Statement	BT Level
CO1	Discuss various sources of electrical energy and different factors related to generating stations.	3
CO2	Describe general layout, major equipments and auxiliaries in thermal power station	3
CO3	Discuss the working of hydro power station.	3
CO4	Discuss the working of nuclear power generation	3
CO5	Describe the different excitation systems, captive plant and cogeneration systems.	3

Sem: Fifth(EE) Course Code : BTCHEE505T Course Name : Electrical Power Utilisation
Student will be able to

CO	CO Statement	BT Level
CO1	Elaborate different industrial heating methods	3
CO2	Demonstrate different electric welding methods	3
CO3	Define basics of illumination terms & lighting scheme for various applications.	3
CO4	Evaluate performance of pumps and DG system	4
CO5	Discuss electric traction system with its power supply structure	3

Sem: Sixth(EE) Course Code : BTCHEE602T Course Name : Computer Applications in Power System

Student will be able to

CO	CO Statement	BT Level
CO1	Formulate the Impedance & Admittance matrix by using singular transformation..	3
CO2	Determine and modify bus Impedance & Admittance matrix by using building algorithms.	3
CO3	Perform the Short circuit calculation for different faults and transformation of 3-phase variables.	4
CO4	Describe the load flow solution by N-R method and transient stability analysis by modified euler's method.	4

Sem: Sixth(EE) Course Code : BTCHEE603T Course Name : Switch Gear & Protection
Student will be able to

CO	CO Statement	BT Level
CO1	Discuss basic terminology of Protective Relaying and components used in Power System protection.	3
CO2	Apply over-current protection schemes for Medium voltage lines.	3
CO3	Apply various distance protection schemes for High voltage lines.	3
CO4	Discuss differential and other protections used for Generator, Transformer and Motors.	3
CO5	Illustrate switching phenomenon and working of various types of circuit breakers.	3

Sem: Sixth(EE) Course Code : BTCHEE605T Course Name : Electrical Drives & Their Control

Student will be able to

CO	CO Statement	BT Level
CO1	Discuss the concept of Electrical characteristics like starting, speed control and braking along with numerical	3
CO2	Identify various factors of industries with reference to PLC, its programming and Digital Control	3
CO3	Describe the causes and effects of motor control used in Electric Vehicle.	3
CO4	Discuss various electrical drives used in industries, AC & DC contactors and work on drives used in Industries	3
CO5	Describe the concept of Electric traction and their control strategies used in practice.	3

Sem: Seventh(EE) Course Code : BTCHEE701T Course Name : Energy Management and Audit

Student will be able to

CO	CO Statement	BT Level
CO1	Discuss the present energy scenario with the need of energy audit and energy conservation.	3
CO2	Recommend appropriate type of Energy Audit looking into user requirements.	4
CO3	Prepare process flow, material and energy balance diagrams.	3
CO4	Prepare an energy action plan and strategy for monitoring and targeting as expected of the Energy Manager.	3
CO5	Select proper energy conservation mechanism for Electrical and Mechanical systems.	3

Sem: Seventh(EE) Course Code : BTCHEE701T Course Name : High Voltage Engineering

Student will be able to

CO	CO Statement	BT Level
CO1	Discuss the breakdown mechanisms in different types of insulation	23
CO2	Illustrate causes and effects of over voltage phenomenon in power systems and their protection	3
CO3	Illustrate the techniques used for the generation of high voltage and currents.	3
CO4	Differentiate the techniques used for measurements of high voltage and currents.	3
CO5	Describe the standard non destructive and high voltage testing of electrical equipments.	3

Sem: Seventh(EE) Course Code : BTCHEE702T Course Name : Electrical Installation Design

Student will be able to

CO	CO Statement	BT Level
CO1	Determine the electrical load, tariff and conductor size.	3
CO2	Calculate symmetrical short circuit current at different location and Select proper switchgear for different protective scheme	3
CO3	Determine ratings of capacitor for reactive power compensation.	3
CO4	Select provision for system and equipment earthing as per I.E rules applicable to residential & industrial Installation	3
CO5	Illustrate procedure for installation testing commissioning of 11 KV and 33 KV transformer Substation	3

Sem: Seventh(EE) Course Code : BTCHEE702T Course Name : Flexible AC Transmission System (FACTS)

Student will be able to

CO	CO Statement	BT Level
CO1	Analyze power flow in AC systems, examining different factors that influence system stability and discussing strategies to maintain stable operation	4
CO2	Explore the importance of voltage and current source converters, highlighting their roles, characteristics, and applications in power electronics systems.	3
CO3	Discuss the role of static shunt compensators in power systems, their operating principles, and impact on system performance and power quality	3
CO4	Examine the function of static series compensators, their implementation, and contributions to power flow control and system stability	3
CO5	Describe the principles and operation of static voltage and phase angle regulators, as well as introduce the basic concept of combined compensators that integrate multiple functionalities into a single device	3

Sem: Seventh(EE) Course Code : BTCHEE703T Course Name : Electric And Hybrid Vehicles

Student will be able to

CO	CO Statement	BT Level
CO1	Discuss electric vehicle dynamics and typologies.	3
CO2	Identify the process of power management system	2
CO3	Analyze various power electronics devices in electric vehicles	4
CO4	Discuss the different electric motors for electric and hybrid vehicles.	3
CO5	Decide electric motor and internal combustion engine match and energy management strategies.	3

Sem: Seventh(EE) Course Code : BTCHEE703T Course Name : Introduction to Smart Grid

Student will be able to

CO	CO Statement	BT Level
CO1	Describe energy scenario and features of smart grid.	3
CO2	Classify components and communication tools and their performance for smooth functioning of smart grid.	3
CO3	Discuss various protection for smart grid and microgrid	3
CO4	Identify components and computational tools for smooth functioning of smart grid.	3
CO5	Describe Sustainable energy options and different issues associated with sustainable energy technologies for the smart grid.	3

Sem: Eighth(EE) Course Code : BTCHEE801T Course Name: Electrical Safety & Standards

Student will be able to

CO	CO Statement	BT Level
CO1	Describe Electrical Safety, Shocks and their Prevention.	3
CO2	Illustration of electrical safety in residential, commercial, agriculture, hazardous areas.	3
CO3	Outline the electrical safety during installation, testing and commissioning procedure.	4
CO4	Discuss specification of electrical plants and classification of safety equipment for various hazardous locations.	3
CO5	Apply Safety Management, Standards in Electrical Systems.	3

Sem: Eighth(EE) Course Code : BTCHEE802T Course Name: Electrical Distribution System

Student will be able to

CO	CO Statement	BT Level
CO1	Describe the general aspects of electrical distribution system	3
CO2	Design the distribution feeders and substations	4
CO3	Discuss the need for protection and distribution automation.	3
CO4	Determine the voltage drop and power loss in the distribution system	3
CO5	Design the parameters for improving the power factor, voltage and power.	4

Sem: Eighth(EE) Course Code : BTCHEE803T Course Name: EHVAC and DC Transmission

Student will be able to

CO	CO Statement	BT Level
CO1	Analyze power handling capacity of different EHVAC transmission lines	4
CO2	Describe Electrostatic and electromagnetic fields and corona in EHVAC lines	3
CO3	Illustrate different types HVDC systems	3
CO4	Analyze power flow control in HVDC lines & design parameters of harmonic filters	4
CO5	Analyze circuit breakers and protective schemes for different HVDC systems	4