

K.D.K. College of Engineering, Nagpur
Department of Electrical Engineering



Course Outcomes (2021-2022)	
Course Code	Course Outcomes
BEEE301T Electrical Engineering Mathematics	
C301.1	Solution of Partial Differential Equations of First Order First Degree, Numerical Solution to Ordinary differential equations
C301.2	Formulation and solving the systems with complex variables
C301.3	Understanding the basics of various Transforms and converting the functions into required transforms, Laplace Transforms analysis and its application to solve differential equations
C301.4	Application of Differential equations and Laplace Transform for mathematical model formulation of the physical systems, Understanding the concept of transfer function
C301.5	Understanding the concepts of Stochastic analysis and its application
BEEE302T Network Analysis	
C302.1	Apply mesh current and node voltage methods to analyze electrical circuits.
C302.2	Apply network theorems for the analysis of networks.
C302.3	Obtain transient and steady-state responses of electrical circuits.
C302.4	Synthesize waveforms and apply Laplace transforms to analyze networks.
C302.5	Evaluate different Network Functions and understand two port network behavior
BEEE303T Electrical Measurement & Instrumentation	
C303.1	Various aspects of measurement and instrumentation.
C303.2	Different active and passive components measurement methods.
C303.3	Power and Energy measurement.
C303.4	Instrument Transformers.
C303.5	Aspects and types of transducers.
BEEE304T Analog Devices & Circuits	
C304.1	Design and Analyze rectifier circuits
C304.2	Understand the characteristics and use of a transistor as amplifiers
C304.3	Apply the knowledge of transistor for the analysis of power amplifiers and oscillators.
C304.4	Understand OP-AMPs.
C304.5	Analyze and utilize OP-AMPs
BEEE305T Renewable Energy studies	
C305.1	Memorize the fundamental of solar radiation geometry
C305.2	Identify and analyse the process of power generation through solar

	photovoltaic
C305.3	Highlighting the various applications of Solar Energy.
C305.4	Outline the site requirement criteria for wind farm & compare different types of wind generators.
C305.5	Identifying non-conventional Energy sources such as Geothermal, MHD, Biomass, Fuel cell, Tidal, Ocean for generating Electricity.
BEEE306T	Introduction to Python programming
C306.1	Identify different operators and execute different programs using loops
C306.2	Analyse Strings, List, Tuples, Dictionary and Sets.
C306.3	Illustrate functions and utilise Date Time in programming language.
BEEE307T	Environmental studies
C307.1	Understand Air pollution and its control techniques
C307.2	Understand Water pollution and its control techniques
C307.3	Understand Various Environmental Pollutions & Waste Management
C307.4	Understand Social Issues and the Environmental Laws
BEEE401T	Signal & Systems
C401.1	Understanding the basics of signal space theory.
C401.2	Understanding the concepts of state space representation.
C401.3	Understand convolution sum of two signals.
C401.4	Apply Fourier and Laplace transforms, understand the duality Apply DFT, DTFT and ztransform.
C401.5	Understand the concept of sampling and reconstruction.
BEELE402T	Digital Electronics
C402.1	Understand number system, logic gates and logic families.
C402.2	Design and implement combinational digital circuits.
C402.3	Design and implement sequential logic circuits.
C402.4	Understand the process of Analog to Digital conversion and Digital to Analog conversion.
C402.5	Understand memories and PLDs to implement given logic.
BEELE403T	Electrical machines-I
C403.1	Determine Equivalent Circuit parameter, Efficiency and Regulation of Single Phase Transformer and to Explain the Phasor groups of Three Phase Transformer. CO2. CO3. CO4. CO5.
C403.2	Analyze different characteristics of D. C. Motor and Speed Control of D.C. Motor.
C403.3	Explain different types of Three Phase Induction Motor and Analyze the characteristics at different Value of Slip.
C403.4	Know Voltage Regulation of Three Phase Synchronous Generator and Behavior of Synchronous Motor with Different Excitations.
C403.5	Understand Single Phase Machines and Special Machines.
BEELE404T	Power System

C404.1	Understand the basic structure of power system , smart grid and micro grid.
C404.2	Model and represent the power system components in its per unit value.
C404.3	Learn the parameters of transmission lines and cables.
C404.4	Evaluate the performance of transmission lines.
C404.5	Acquaint with the method of load flow analysis and the concept of voltage stability.
BEELE405T	Electromagnetic Fields
C405.1	Recognize and apply the knowledge of different co-ordinate systems.
C405.2	Evaluate the physical quantities of electromagnetic fields in different media and apply Gauss law.
C405.3	Describe static electric fields boundary conditions, nature of dielectric materials and evaluate potential fields.
C405.4	Explain steady magnetic fields, their behavior in different media, associated laws and inductance.
C405.5	Understand Maxwell's equations in different forms and different media.
BEELE406T	Simulation & Programming Techniques
C406.1	Learn the basics of C programming and apply the knowledge for developing small programs including Function.
C406.2	Apply the knowledge of C language for developing simple programs using variables, arrays, structures etc. for applications like searching and sorting, use of pointers & File handling functions.
C406.3	Understand the basics of C++
C406.4	Study the basic of MATLAB and apply fundamental knowledge for analysis of basic engineering problems.
C406.5	Apply knowledge of MATLAB, Toolboxes and Simulink to solve matrix equations, plot graphs, build and analyze simple electrical circuits.
BEELE501T	ELECTRICAL POWER SYSTEM - I
C501.1	Understand basics of Power System.
C501.2	Modeling & representation of the system components used in power system.
C501.3	Understand use of cables in distribution network.
C501.4	Concept of designing transmission line parameters.
C501.5	The basic concept of load flow analysis.
C501.6	Analyze performance of generators & turbines.
BEELE502T	UTILIZATION OF ELECTRIC ENERGY
C502.1	Understand use of electric energy for industrial heating and welding.
C502.2	Understand basics of Illumination and design of lighting schemes for Various applications.
C502.3	Understand basics of Refrigeration and Air conditioning system.
C502.4	Understand application of Fans & Pumps.
C502.5	Understand compressors and DG systems and evaluate their

	performance.
BEELE503T	ELECTRICAL MACHINE DESIGN
C503.1	Select proper material for design of a machine.
C503.2	Design an overall transformer and estimates its performance characteristics as per requirements and constraints specified.
C503.3	Design rotor core of Induction Motor.
C503.4	Design overall dimensions of synchronous machines.
BEELE504T	MICROPROCESSOR & INTERFACING
C504.1	Student should be able to use and apply VLSI circuit concept.
C504.2	Introducing to INTEL 8085A architecture.
C504.3	Programming Instructions
C504.4	Interrupts
C504.5	Methods of data transfer
C504.6	Hardware and Interface
BEELE505T	Electrical Machines-II
C505.1	Understand Principle, construction and operation of synchronous machine.
C505.2	Understand parallel operation of synchronous generators and experimental determination of parameters.
C505.3	The student has understood principle, construction, methods of starting synchronous motor, its operation with variable load, operation with variable excitation, performance evaluation.
C505.4	The student has understood special motors like Repulsion, Hysteresis, Reluctance, Universal and Schrage motors.
BEELE601T	POWER STATION PRACTICE
C601.1	Understand various sources of electrical energy and different factors related to generating stations and connected load.
C601.2	Study general layout, major equipments and auxiliaries in thermal power station.
C601.3	Learn basics of hydro power station.
C601.4	Learn basics of nuclear, power generation, co-generation, and captive power generation.
C601.5	Calculate tariff for different customers.
BEELE602T	ENGINEERING ECONOMICS & INDUSTRIAL MANAGEMENT
C602.1	After the completion of course the students will be able to manage the thing economically
BEELE603T	ELECTRICAL DRIVES & THEIR CONTROL
C603.1	Learn speed/ torque characteristics of common drive motor and analyze behavior of electric motor during starting, running, and breaking.
C603.2	Select motor for continuous and intermittent operation.
C603.3	Study PLC and applications on electric drives.
C603.4	Study operation of relays and contractors and design control panel for MCC.
C603.5	Study and analysis of traction motors.

C603.6	Learn basics of industrial drives.
BEELE604T	POWER ELECTRONICS
C604.1	Understand basic operation of various power semiconductor devices and switching circuits.
C604.2	Analysis and design of power electronic converter circuit.
C604.3	Study power electronics for performance and improvement of power system and electric machines.
C604.4	Study principle and operation of DC choppers.
C604.5	Study and analyze power electronic inverter circuits.
BEELE605T	CONTROL SYSTEM - I
C605.1	Model the linear systems and study the control system components specifications through classical and state variable approach.
C605.2	Understand the time response and time response specifications.
C605.3	Analyze the relative stability through root locus method.
C605.4	Frequency response tools like bode plot and nyquist plot.
C605.5	Understand the introductory concepts of state variable approach.
BEELE701T	CONTROL SYSTEMS –II
C701.1	Understand the basic knowledge of compensation in time and frequency domain.
C701.2	Design and analysis of practical system for the desired specifications through state variable approach.
C701.3	Analyze the optimal control with and without constraints.
C701.4	Analysis of non-linear control system for various non-linearities.
C701.5	Analysis of digital control system.
BEELE702T	ELECTRICAL POWER SYSTEM – II
C702.1	Analysis of power system using symmetrical components transformation.
C702.2	Do symmetrical fault analysis.
C702.3	Do unsymmetrical fault analysis.
C702.4	Understand the concept of steady state and transient stability.
C702.5	Understand the economic scheduling of power system.
C702.6	Understand the various types of neutral grounding and compensation.
Elective- I BEELE703T (1)	I.T. & ITS APPLICATIONS IN POWER SYSTEM CONTROL
C703(1).1	Understand the communication used for automation.
C703(1).2	Understand the various aspects of energy auditing in industry
C703(1).3	Do the networking of communication in industry with instrumentation and microprocessors.
Elective- I BEELE703T (2)	FUZZY LOGIC & NEURAL NETWORK
C703(2).1	Understand the fundamentals of fuzzy logic and ANN.
C703(2).2	Learn different neural networks
C703(2).3	Learn concepts of Associative memories and self organizing network.
Elective- I BEELE703T (3)	FLEXIBLE AC TRANSMISSION SYSTEMS
C703(3).1	Understand basic concept of FACTS

C703(3).2	Understand voltage and current source converters for FACTS.
C703(3).3	Understand basic knowledge of shunt compensator.
C703(3).4	Understand basic knowledge of series compensator.
C703(3).5	Understand static voltage and phase angle regulators.
C703(3).6	Understand basic knowledge of combined series and shunt compensators.
Elective- I BEELE703T (4) ENERGY MANAGEMENT AND AUDIT	
C703(4).1	Know Present energy scenario with need of energy audit and energy conservation.
C703(4).2	Understand various aspects of energy audit and management.
C703(4).3	Understand and analyze material and energy balance and study co-generation and waste heat recovery.
C703(4).4	Understand key factors of energy action planning, monitoring and targeting.
C703(4).5	Understand and incorporate electric and thermal energy management in the industry.
BEELE 704 T HIGH VOLTAGE ENGINEERING	
C704.1	Understand Breakdown mechanism in solid, liquid and gaseous medium.
C704.2	Understand Lightning and switching over-voltages and protection of lines by lightening arrestors, ground wires and surge absorbers.
C704.3	Understand travelling waves and insulation co-ordination.
C704.4	Understand generation of high voltage and current by different methods.
C704.5	Understand measurement of high voltage and current by different methods in laboratories.
C704.6	Do non destructive and high voltage testing of electrical apparatus by different techniques.
BEELE 705 T - ELECTRICAL INSTALLATION DESIGN	
C705.1	The students will understand concept of load forecasting, solve problems based on regression analysis.
C705.2	The students will be able to draw single line diagram with specifications for electrical distribution network for residential and commercial installations and will able to draw single line diagrams with specifications for distribution networks, motors and power control centers for industrial installations and design reactive power compensation.
C705.3	The students will be able to understand construction, types and selection of PVC/XLPE cables and overhead conductors.
C705.4	Students shall be able to design 11KV and 33KV substations for utility and industrial installations and specify the ratings and specification of apparatus used and they will be able to understand procedure for receipt, storage, testing and commissioning of transformers along with its accessories viz OTI, WTI, Silica gel breather, MOG, buchholz relay etc
C705.5	Students will be able to determine fault level at various locations in radial networks and be able to find rating and location of series

	reactor.
C705.6	Students will understand the relevant provisions of IE rules for low, medium and high voltage installations and will be able to understand provisions for system and equipment earthing as per IS 3043
BEELE706 P PROJECT SEMINAR	
C706.1	Do literature survey using library, internet, technical journals, product catalog, datasheets etc for a defined area.
C706.2	Understand & deliver the seminar topic.
C706.3	To enhance the skills of self- study and lifelong learning.
ELECTIVE-II BEELE 801 T (4) - EHV AC & HVDC TRANSMISSION	
C801(4).1	Student will be able to demonstrate the knowledge of Power handling capacity of different Transmission systems.
C801(4).2	Effect of Electrostatic and electromagnetic fields and corona due to EHVAC lines.
C801(4).3	Voltage control and current control systems for power flow controls in HVDC system.
C801(4).4	The knowledge of design parameters of AC filters as well as DC filters and Reactive power compensation.
C801(4).5	Overall knowledge about the HVDC system such as MTDC, protection and substation layout of HVDC power plant.
ELECTIVE-III BEELE 802 T (3) -POWER SEMICONDUCTOR BASED DRIVES	
C802(3).1	Understand dynamics of electrical drives.
C802(3).2	Understand and analyze the motor drives using power electronics devices.
C802(3).3	Understand and analyze AC motor using power electronic devices.
C802(3).4	Study the special motors and energy conservation in electrical drives.
C802(3).5	Understand the traction drives.
ELECTIVE-III BEELE 802 T (4) ELECTRICAL DISTRIBUTION SYSTEM	
C802(4).1	Student will able to calculate different distribution factors.
C802(4).2	Understand classification of load, types of load curves.
C802(4).3	Control of voltage and reactive power in distribution system.
C802(4).4	Understand distribution automation.
C802(4).5	Understand distribution substation layout with associated equipments.
BEELE 803 T -SWITCH GEAR AND PROTECTION	
C803.1	Student has understood theory and application of main components used in power system protection.
C803.2	Protection systems used for electric machines, transformers, bus-bars, transmission lines.
C803.3	Theory, construction and applications of main types of circuit breakers.
C803.4	Design the protection system needed for each main part of a power system.
BEELE 804 T - COMPUTER APPLICATIONS IN POWER SYSTEM	
C804.1	Students will be able to determine bus Impedance & Admittance matrix by graphically, inspection and building algorithm.

C804.2	Load flow study of a power system by Newton- Raphson and Gauss-Seidal iterative method.
C804.3	Short circuit studies.
C804.4	Transient stability by using Eulers, Modified Eulers and RK-4 th order differential method.
BEELE805P PROJECT	
C805P.1	Students will be able to apply technical & Managerial skills for analysis, design, simulation & modeling of Engineering problems.
C805P.2	To learn the time & Finance management for task completion in a group with professional ethics.
C805P.3	To present their work in a professional manner.
C805P.4	To enhance the skills of self study and lifelong learning.