

Suryodaya College of Engineering & Technology
Department of Electrical Engineering

3.1.1 Course Outcomes (2021-22)

Course Code	Course Outcomes
BEELE302T	Non Conventional Energy Source
C302.1	Learn fundamentals of Solar radiation & measurement.
C302.2	Understand principal of solar energy collectors and storage systems.
C302.3	Learn various applications of solar energy.
C302.4	Perform selection of sites for wind farm and different types of wind generators.
C302.5	Understand basic of small hydra, ocean, and wave energy and other non-conventional energy sources.
BEELE303T	Electrical Measurement and Instrumentation
C303.1	Understand the details of different bridges used for measurement of RLC
C303.2	Understand the details of different electrical measuring instruments.
C303.3	Measure the electrical power and energy and use of CT, PT
C303.4	Study the generalized instrumentation system with the help of a block diagram
C303.5	Know the transducers and its use for measurement of force, torque, velocity, acceleration.
C303.6	Understand the basic idea about measurement of temperature, pressure & flow measurement.
BEELE304T	Network Analysis
C304.1	Apply the knowledge of source transformation and kirchoff's voltage on electrical networks.
C304.2	Apply the knowledge of kirchoff's current law for analysis of electrical circuits and conversion of circuit using duality.
C304.3	Apply various networks theorem for analysis of electrical circuits.
C304.4	Evaluate the initial conditions using knowledge of Laplace transformation and analysis of various waveforms.
C304.5	Know the Two Port network.
C304.6	Apply the knowledge of resonance for series and parallel RLC circuit and calculation of various electrical quantities for 3 phase circuits.
BEELE305T	Electronic Devices & Circuits
C305.1	Principle and working of basic semiconductor devices, transistors, amplifiers, FET & MOSFETS.
C305.2	Conversion of numbers from one code to other code.
C305.3	Logic gates and truth tables of digital circuits.
BEELE301T	Applied Mathematics-III
CO301.1	Understand the properties of Laplace transform solve various

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	engineering Problems
CO301.2	Competent to work out the <u>Fourier series</u> representation of a periodic function and to solve partial differential equations
CO301.3	Find the extreme values of functional's using Euler's equation.
CO301.4	Understand analytic function of a complex variable and to apply Cauchy integral theorem and residue theorem to solve contour integrations
CO301.5	To solve ordinary differential equations with constant coefficients and apply the method of separation of variables to solve Partial differential equations.
CO301.6	Apply concept related to matrix algebra for solving linear differential equations and other engineering problems.
BEELE402T	Elements of Electromagnetic
C402.1	To understand vector analysis using different coordinate system.
C402.2	To study coulomb's law and able to calculate Electric field intensity, Flux density for difference form of charges.
C402.3	To understand and apply Gauss's law, Divergence theorem and calculation of Potential and Energy density in electrostatic field.
C402.4	To study Poisson's and Laplace equation and to calculate capacitance and their boundary condition for Dielectric Materials.
C402.5	To study various laws for steady magnetic fields and forces.
C402.6	To apply Maxwell's equation and analysis of uniform plane wave propagation and electromagnetic waves.
BEELE403T	DIGITAL AND LINEAR ELECTRONIC CIRCUITS
C403.1	Basic fundamentals of Logic gates, Flip Flops, Timers
C403.2	Basic operational amplifier circuits.
C403.3	Simple linear circuit.
C403.4	Applications of Operational Amplifier.
C403.5	Study of linear ICS.
BEELE404T	ELECTRICAL MACHINES-I
C404.1	Principle, construction, connections, vector grouping, operation and testing of 3-phase transformer.
C404.2	Conversion of 3-phase supply to 2- phase supply, parallel operation of 3-phase transformer.
C404.3	Principle, armature and field construction, types, operation characteristics, armature reaction, commutation, methods to improve commutation in dc generators.
C404.4	Principle, types, voltage build up, performance characteristics, torque evaluation in DC motors.
C404.5	Principle, construction, types, torque development, performance characteristics, tests to determine performance indices & parameters of equivalent circuit of 3-phase and double cage induction motors,

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	methods of starting, speed control and braking of induction motors
C404.6	Revolving and cross field theories, operation, characteristics, types, equivalent circuit & tests.
BEELE405T	COMPUTER PROGRAMMING
C405.1	Basic of C programming.
C405.2	Use of arrays, searching and sorting techniques.
C405.3	Use of pointers & structures.
C405.4	Basics of C++
C405.5	Basic of MATLAB and apply fundamental knowledge for analysis of basic engineering problems.
BEELE406T	ENVIRONMENTAL STUDIES
C406.1	The student on completion of course will understand the ecosystem.
C406.2	Environmental issues related with social and human population.
C406.3	Biodiversity and its conversion.
BEELE401T	APPLIED MATHEMATICS-IV
C401.1	Understand Mathematical Modeling of linear systems and study the control system components specifications through classical and state variable approach.
C401.2	Find the Z- Transform, inverse Z- Transforms of a sequence , identify its region of convergence and develop an ability to solve problems in various branches of Engineering
C401.3	Understand the fuzzy sets and fuzzy logic and know the application of fuzzy logic
C401.4	Ability to understand numerical method to solve algebraic, transcendental and system of simultaneous linear equation
C401.5	Apply the knowledge of Numerical Methods to solve ordinary differential equations of first order and first degree and Boundary value problems
C401.6	Prepare to understand Probability Theory properties to analyze and evaluate the problems under consideration.
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

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	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	The student has to Understand the Principle, construction, operation, types of winding, generation of EMF of synchronous machine.
C505.2	The student has to Understand the steady state operation of 3-ph synchronous machines using different voltage Regulation methods & slip test.
C505.3	The student has to understand parallel operation and determination of parameters, efficiency & losses
C505.4	To understand the synchronous machine on infinite bus, synchronous motor operation with variable excitation & load.
C505.5	The student has to understand the transient behavior & their measurement, equivalent circuit Diagram, Hunting & Damper winding
C505.6	The student has to understood special motors like Repulsion, Hysteresis, Reluctance, Universal and BLDC 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.

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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.

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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 lightning 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

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	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 801T (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.

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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.