KLS Vishwanathrao Deshpande Institute of Technology
(Accredited by NAAC with 'A' Grade)
(Approved by AICTE, New Delhi | Affiliated to VTU, Belagavi)
(Recognized Under Section 2(f) by UGC, New Delhi)
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Department of Electrical & Electronics

CO statements for 2020-24 batch

	Subject	CO
C101.1	Calculus and Linear Algebra	Apply the knowledge of calculus to solve problems related to polar curves and its applications in determining the bendiness of a curve.
C101.2		Learn the notion of partial differentiation to calculate rates of change of multivariate functions and solve problems related to composite functions and Jacobians
C101.3		Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing the area and volumes
C101.4		Solve first order linear/non-linear differential equations analytically using standard methods
C101.5		Make use of Matrix theory for solving system of linear equations and compute Eigen values & Eigenvectors required for matrix diagonalization process
C102.1	Engineering Physics	Learn and understand various types of oscillations and their implications, Recognize the significance of shock waves and its applications in various fields
C102.2		To get acquainted with the elastic properties of materials by understanding the definitions of elasticity, stress, strain, modulus of rigidity, Young's modulus, bulk modulus and elastic limit.
C102.3		To realize the interrelation between time varying electric field and magnetic field, properties of electromagnetic (EM) waves, Maxwell's equations and their role in optical fiber communication.
C102.4		Gain knowledge of the intricacies of matter and energy, which is essential to explore the role of subatomic particles in understanding properties of matter at macro, micro and nano-level using the principles of quantum mechanics and to understand the physics of lasers, various types of lasers and to appreciate their role in modern technology.
C102.5		Learn the niceties of technologically important material such as conductor, semiconductor and dielectrics, their potential properties in understanding there use in engineering applications.
C103.1	Basic Electrical Engineering	To comprehend the basic concept of AC and DC circuit
C103.2		To Explain the working principle and construction of AC and DC machines
C103.3		To Explain the working principle and construction of transformer.
C103.4		To Understand the electrical wiring concepts, earthling, domestic protection devices and electric shock.
C104.1	Elements of Civil Engineering & Mechanics	Mention the applications of various fields of Civil Engineering
C104.2		Compute the resultant of given force system subjected to various loads
C104.3		Comprehend the action of Forces, Moments and other loads on systems of rigid bodies and compute the reactive forces that develop as a result of the external loads.
C104.4		Locate the Centroid and compute the Moment of Inertia of regular and built-up sections
C104.5		Express the relationship between the motions of bodies and analyze the bodies in motion.
C105.1	Engineering Graphics	Prepare engineering drawings as per BIS conventions mentioned in the relevant codes
C105.2		Produce computer generated drawings using CAD software.
C105.3		Use the knowledge of orthographic projections to represent engineering information / concepts and present the same in the form of drawings
C105.4		Develop isometric drawings of simple objects reading the orthographic projections of those objects.
C105.5		Convert pictorial and isometric views of simple objects to orthographic views
C106.1	Engineering Physics	To recognize the importance of light by exploring its interaction with matter and in realizing

	Laboratory	its characteristic properties
C106.2		Understanding of mechanical properties of the material by the application of stress.
C106.3		Appreciating the significance of elementary electric circuits in the functioning of various electric /electronic devices and gaining understanding of physics of the materials.
C106.4		Design and implementation of electronic circuits to gain better understanding of physics of semiconductor devices.
C106.5		Appreciating the role of Quantum mechanics in exploring the electrical properties of the materials.
C107.1	Basic Electrical Engineering Laboratory	Identifying the common electrical components and measuring instruments used for conducting experiments in electrical laboratory.
C107.2		Determine the current, power drawn and comparing power factor of the different lamps
C107.3		Determine impedance of an electrical circuit and power consumed in a 3 phase load.
C107.4		Determine the earth resistance and understand the operation of two way and three way control of lamp.
C107.5		Understand the basic functioning of domestic appliances like fuse, MCB,UPS
C108.1	Technical English – I	Use grammatical English and essentials of language skills and identify the nuances of phonetics, intonation and flawless pronunciation
C108.2		Implement English vocabulary at command and language proficiency
C108.3		Identify common errors in spoken and written communication
C108.4		Understand and improve the non-verbal communication and kinesics
C108.5		Perform well in campus recruitment, engineering and all other general competitive examinations
C109.1	Advanced Calculus and Numerical Methods	To solve first order linear/nonlinear differential equations analytically using standard methods
C109.2		Explain various physical models through higher order differential equations and solve such linear ordinary differential equations
C109.3		Understand a variety of partial differential equations and solution by exact methods/method of separation of variables
C109.4		Describe the applications of infinite series and obtain series solution of ordinary differential equations
C109.5		Apply the knowledge of numerical methods in the models of various physical and engineering phenomena
C110.1	Engineering Chemistry	Knowledge on the use of free energy in equilibrium, rationalize bulk properties and processes using thermodynamic considerations, electrochemical energy systems.
C110.2		Knowledge on the causes and effects of corrosion of metals and control of corrosion. Modification of the surface properties of metals to develop resistance to corrosion, wear, tear, impact, etc. by electroplating and electro less plating.
C110.3		Knowledge on the importance of energy conservation in the context of energy crisis, fuel properties and importance of solar energy as sustainable source and PV cells for solar energy conversion.
C110.4		Knowledge on the environmental pollution, waste management and water chemistry.
C110.5		Knowledge on the different techniques of instrumental methods of analysis. Fundamental properties of nonmaterial's.
C111.1	C Programming for Problem Solving	Illustrate simple algorithms from the different domains such as mathematics, physics, etc.
C111.2		Construct a programming solution to the given problem using C.
C111.3		Identify and correct the syntax and logical errors in C programs.
C111.4		Modularize the given problem using functions and structures.
C112.1	Basic Electronics	Outline the operation of semiconductor diodes, and its applications like rectifiers, photo couplers, and fixed voltage IC regulator and apply the concepts to solve the numerical of rectifiers
C112.2		Describe the general operating principles of JFET, MOSFET, SCR, by applying their concepts to various applications.
C112.3		List the characteristics of the opamp and describe the operations of simple opamp circuits and apply the same concepts to solve the numerical
C112.4		By outlining the characteristics of feedback amplifiers explain different types of feedback along with the working of bjt amplifiers, and apply the concept of Barkhausens criteria to obtain the oscillations.
C112.5		Explain the different number system and their conversions and construct simple combinational and sequential logic circuits using flip flops.

C112.6		Describe the basic principle of operation of communication system and mobile phones.
C113.1	Elements of Mechanical Engineering	Learn the fundamental concepts of energy, its sources, conversion Laws of Thermodynamics
C113.2		Understand the concepts of boilers, turbines, pumps, internal combustion engines and refrigeration
C113.3		Understand properties of different materials and Distinguish different metal joining techniques
C113.4		Learning belt drives and gear drives and their applications.
C113.5		Enumerate the knowledge of working with conventional machine tools, their specifications.
C114.1	Engineering Chemistry Laboratory	Knowledge in handling different types of instruments for analysis of materials using small quantities of materials involved for quick and accurate results
C114.2		Knowledge in carrying out different types of titrations for estimation of concerned materials using comparatively more quantities of materials involved for good results
C115.1	C Programming Laboratory	Write algorithms, flowcharts and program for simple programs.
C115.2		Correct syntax and logical errors to execute a program.
C115.3		Write iterative and wherever possible recursive programs.
C115.4		Demonstrate use of functions, arrays, strings, structures and pointers in problem solving.
C115.5		Write algorithms, flowcharts and program for simple programs.
C116.1	Technical English - II	Identify common errors in spoken and written communication
C116.2		Get familiarized with English vocabulary and language proficiency
C116.3		Improve nature and style of sensible writing and acquire employment and workplace communication skills
C116.4		Improve their technical communication skills through technical reading and writing practices
C116.5		Perform well in campus recruitment, engineering and all other general competitive examinations
C201.1	Tran calcu four series &num	To understand the concept of Laplace transform and inverse Laplace transform and its properties.
C201.2		To understand the behavior of periodic functions using Fourier series.
C201.3		To illustrate discrete/continuous functions using Fourier transform and Z-transform.
C201.4		To determine the solution of ODE by using Numerical techniques
C201.5		To determine the externals of functional using calculus of variations.
C202.1	Electric Circuit Analysis	Understand the basic concept, basic laws and methods of analysis of DC and AC networks and reduce the complexity of network using source shifting, source transformation and network reduction using transformations.
C202.2		Solve complex electric circuits using network theorem.
C202.3		Discus resonance in series and parallel circuits and also the importance of initial conditions and their evaluation.
C202.4		Synthesize typical waveforms using Laplace transformation.
C203.1	Transformer & Generators	Understand the constructional aspects and concepts of Single phase, Three phase transformer, Auto transformer DC Generator, AC Generator
C203.2		Understand the types of connections, operations and tests carried on Transformers, DC Generator, AC Generator
C203.3		Understand the Equivalent circuits and performance parameters of Single phase, Three phase, transformer, DC Generator, Synchronous Generator
C204.1	Analog Electronics	Analyse the working principle of various microwave sources and components.
C204.2		Appreciate usage and working of microwave devices and realize them with the help of quantitative parameters.
C204.3		Familiarize with basic antenna parameters and developed competency to design an antenna.
C204.4		Design an antenna array by determining its performance parameters and analyze the various antenna dipoles.
C205.1	Digital System Design	Design and analyze combinational & sequential circuits
C205.2		Design circuits like adder, subtractor, code converter etc.
C205.3		Understand sequential circuits, counters and sequence generators.
C205.4		To understand Mealy and Moore models, State machine notation, Read only and Read/Write memory.
C206.1	EE Measurements	To understand the methods to find R, L and C by different using different bridges
C206.2		To understand the construction and operating principle of different instruments used for measuring various electrical quantities

C206.3		To understand the different display devices and recording devices used in the measuring instruments
C207.1	Electric Machines Lab -I	Evaluate the performance of transformers from the test data obtained
C207.2		Connect and operate two single phase transformers from the test data obtained.
C207.3		Connect single phase transformers for three phase operation and phase conversion
C207.4		Compute the voltage regulation of synchronous generator using the test data obtained in the laboratory.
C208.1	Electronics Lab	Understand the design and experimental analysis of analog circuits and verifying operational results with help of devices like CRO, Function Generator, Multimeter, ammeter, voltmeter,
C208.2		Understand the Digital circuits design concepts and verifying truth tables with hardware kit
C208.3		Understand the simulation of analog and digital circuits with free softwares and verifying truth tables.
C209.1	Adalita Kannada	ಕನ್ನಡ ಭಾಷೆ ಸಾಹಿತ್ಯ ಸಂಸ್ಕೃತಿ ಮತ್ತು ನಾಡುನುಡಿಯ ಪರಿಚಯವಾಗುತ್ತದೆ
C209.2		ತಾತಂತ್ರಿಕ ವಿಜ್ಞಾನಗಳಿಗೆ ಸಂಬಂಧಿಸಿದ ವಿಷಯಗಳು ಪರಿಚಯವಾಗುತ್ತದೆ
C209.3		ಕನ್ನಡ ಭಾಷಾಭ್ಯಾಸ ಸಾಮಾನ್ಯ ಕನ್ನಡ ಹಾಗು ಆಡಳಿತ ಕನ್ನಡ ಪದಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ
ADD on	Data communication networking	Understand the fundamental concept of Data Communication and Networking performance parameters.
		Understand Network Models like OSI model/TCP IP protocol suite with different layers involved, Types and Networking Devices.
		Understand the Computer Network Topologies and Network Addresses.
C210.1	Complex anal, prob & statistica	To understand the concept of complex functions.
C210.2		To understand the concept of complex integration.
C210.3		To apply discrete and continuous probability distributions in analyzing the probability models.
C210.4		To make use of the correlation and regression concept to fit a suitable mathematical model for the statistical data.
C210.5		To construct the joint probability distributions and analyze samples by using various sampling techniques.
C211.1	Power Generation & Economics	Working of principle of hydro, nuclear, steam and other related equipments of 3power generation,
C211.2		Distinguish substation and operation of substation equipments.
C211.3		Importance of grounding and grounding methods used in practice
C211.4		Importance of power factor and economics aspects considered during generation
C212.1	TD	Able to derive expression for sag and tension at all levels with the effect of wind and ice
C212.1		Able to explain concept of corona and derive expressions for methods of string efficiency for insulator.
C212.1		Able to explain different types of HV cables and derive expression for insulation resistance of cable.
C212.1		Able to Demonstrate the capacitance and inductance of 3 phase lines with equilateral and unsymmetrical spacing with mathematical expressions.
C212.1		Able to explain the performance of all the transmission lines and classification of distribution system.
C213.1	Electric Motors	Students will be able to explain the constructional features and working of different electric motors and select a suitable drive for specific application.
C213.2		Students will be able to explain the different methods to start and to control the speed of electric motors.
C213.3		Students will be able to analyze and assess the performance characteristics of different electric motors by conducting suitable tests.
C214.1	Electromagnetic Field Theory	Student will be able to: Scalars and Vectors, Vector algebra, Cartesian co-ordinate system, Vector components and unit vectors Understand calculation of electric field and electric potential, capacitance for different charge geometries and able to solve problem based on that.
C214.2		Learn and Calculate magnetic field magnetic vector potential, magnetic boundary condition, force calculation between current carrying wires.
C214.3		Understand the concept of Faradays law, displacement current, there by deriving the Maxwell's equations
C214.4		Understand wave equations and its solution in free space, dielectric, conductor & Poynting

		theorem.
C215.1	Operational amplifier and linear ICs	Understand the basics of Op amp and its characteristics and also the various Applications of Op amp. Able to distinguish between different types of Op amp
C215.2		Understand the operation, design of first and second order high pass and low pass filters, band pass filters, band stop filters. And also analyze the various types of DC voltage regulators.
C215.3		Understand and design of different signal waveform generator and also about different comparators and converters.
C215.4		Understand the different signal processing circuits and also analyze and apply the A/D and D/A converters.
C215.5		Understand the structure of 555 Timer and analyze the Operation of Phase Locked Loop and its applications
C216.1	Electrical machine laboratory -2	Students will be able to assess the performance characteristics of DC Machines by conducting suitable tests.
C216.2		Students will be able to control speed of DC Shunt Motor using different methods.
C216.3		Students will be able to assess the performance characteristics of a 1- ϕ and 3- ϕ Induction Motor by direct and indirect methods.
C216.4		Students will be able to draw V and inverted V curves of a Synchronous Motor
C217.1	Op- amp and linear ICs laboratory	Understand the design and experimental analysis of analog circuits and verifying operational results with help of devices like CRO ,Function Generator, Multimeter, ammeter, voltmeter,
C217.2		Understand the Digital circuits design concepts and verifying truth tables with hardware kit
C217.3		Understand the simulation of analog and digital circuits with free software's and verifying truth tables.
C218.1	Con. Of India, professional Ethics & cyberr law	Have constitutional knowledge and legal literacy.
C218.2		Understand engineering and professional ethics and responsibilities of engineers.
C218.3		Understand the cyber crimes and cyber laws for cyber safety measures.
ADDON	PSpice and its applications	To apply the fundamental knowledge of diodes and their applications
		To apply the fundamental knowledge of feedback amplifier and oscillators
		To apply the fundamental knowledge of Op-Amp and their applications
C301.1	Management And entrepreneurship	To understood the field of management, task of the manager, planning and steps in decision making
C301.2		To understood the structure of organization , importance of staffing, leadership styles, modes of communication, techniques of coordination and importance
C301.3		To understood the concepts of entrepreneurship and a businessman's social responsibilities towards different groups.
C301.4		To understood the role of SSI in the development of country and state/central level institutions/agencies supporting business enterprises.
C301.5		To understood the concepts of project management, capital budgeting, project feasibility studies, need for project report and new control techniques
C302.1	Microcontroller	To understand the general aspects related to microcontroller, types, applications of 8051 etc. Architecture, Pin Diagram, Addressing Modes & Block Diagram of 8051 Microcontroller.
C302.2		To understand Instruction Set of 8051 microcontroller & able to write Assembly Program. Also Assembly & C program for interfacing 8051 with ADC, DAC, Stepper motor etc using 8255 also.
C302.3		To understand Timers of 8051 & able to write Assembly & C programs.
C302.4		To understand Interrupts & Serial Communication of 8051 & able to write Assembly & C programs.
C303.1	Power Electronics	To explain the overview of applications of power electronics, different types of power semiconductor devices and circuits
C303.2		To discuss the characteristics and different types of power diodes and power diode rectifiers with different load combinations
C303.3		To explain the types and their characteristics of different power transistors and Thyristors
C303.4		To explain the principle of operation, classification and behavior with different load combinations of power converters such as AC-DC, AC-AC, DC-DC, DC-AC converters
C304.1	Signals And Systems	Explain the various types of signals, behavior of system and the basic operations that can be performed on signals and properties of systems.
C304.2		Apply convolution in both continuous and discrete domain for the analysis of systems given impulse response of a system. Solve the continuous time and discrete time systems by

		various methods and their representation by block diagram
C304.3		Perform Fourier analysis for continuous and discrete time, linear time invariant systems.
C304.4		Apply Z-transform and properties of Z transform for the analysis of discrete time systems.
C305.1	Electrical Machine Design	Understand the different conducting, insulating and magnetic materials & their properties used in electrical machines.
C305.2		To understand the Design of Transformers, Induction Motors, (1Φ,3Φ) , Synchronous Machine based on given based on
C305.3		Understand the Design of DC Machines based on given specifications.
C306.1	High voltage engineering	Conduction and breakdown mechanisms in solids and gaseous forms of insulating materials
C306.2		Different ways of different methods of generating high voltages and currents (A,C,D,C Impulse)
C306.3		Occurrence of over voltages and insulation coordination in the power system
C306.4		Different methods of measuring the high voltages and currents and the testing of electrical equipments
C307.1	Microcontroller lab	Write assembly language programs for data transfer, arithmetic, Boolean and logical instructions.
C307.2		Write ALP for code conversions.
C307.3		Write ALP using subroutines for generation of delays, counters, configuration of SFRs for serial communication and timers.
C307.4		Perform interfacing of stepper motor and dc motor for controlling the speed.
C307.5		Generate different waveforms using DAC interface.
C308.1	Power Electronics Lab	To conduct experiment and the explain characteristics of power semiconductor devices
C308.2		To demonstrate the triggering of SCR using UJT relaxation oscillator and digital triggering circuit
C308.3		To verify the performance of controlled full wave rectifier, AC voltage controller and PWM inverter
C308.4		Perform speed control of DC motor, universal motor and stepper motor using suitable power converter
C309.1	Environmental studies	Understand the principles of ecology and environmental issues that apply to air, land and water issues on a global scale
C309.2		Develop critical thinking and observation skills and apply them to the analysis of a problem or question related to the environment
C309.3		Demonstrate ecology knowledge of a complex relationship between biotic and a biotic components
C309.4		Apply their ecology knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.
ADDON	Electrical vehicle	To understand the Electric vehicle evolution, different types, Tractive Effort in Normal Driving Electric Propulsion EV consideration,
		DC motor drives and speed control, Induction motor drives, Permanent Magnet Motor Drives, Switch Reluctance Motor Drive for Electric Vehicles, Configuration and control of Drives.
		I have understood the Scilab, simple operation involved in that and Xcos platform for modeling of the various applications.
C310.1	CS	Students will be able to define, classify control systems and form mathematical model of physical systems.
C310.2		Students will be able to apply block diagram manipulation and signal flow graph method to obtain transfer function of system.
C310.3		Students will be able determine transient and steady state time response of a simple control system.
C310.4		Students will be able to discuss stability analysis using RH criterion, Root locus, Bode plots and Nyquist plots.
C310.5		Students will be able to design controller or compensator for given control system.
C311.1	Power system analysis -I	Model the power system components & construct per unit impedance diagram of power system.
C311.2		Analyze three phase symmetrical faults on power system. Compute unbalanced phasors in terms of sequence components and vice versa, also develop sequence networks.
C311.3		Analyze various unsymmetrical faults on power system
C311.4		Examine dynamics of synchronous machine and determine the power system stability.
C312.1	Digital Signal	To understand the basics related to DSP and student should be able to compute and evaluate

	Processing	the DFT and IDFT of given DTS.
C312.2		Student should be able to compute and evaluate the DFT and IDFT of given DTS by DIT and DIF-FFT algorithms.
C312.3		To understand the basic related to analog filters and their design. Further students should able to design digital IIR and FIR filters and develop the computation structures of them.
C313.1	Sensors and transducers	To explain the operation of transducers/gauges used for measurement of distance, motion, strain, pressure, light and radiation associated with light
C313.2		To explain the operation of transducers/gauges used for measurement of temperature, thermal radiation, sound, infrasound and ultrasound
C313.3		To explain the operation of transducers/gauges used for measurement of solid, liquid, gases and some specific environmental parameters
C314.1	Introduction To Data Structures And Algorithms	Identify different data structures in C programming language
C314.2		Appraise the use of data structures in problem solving
C314.3		Implement data structures using C programming language.
C315.1	Non-Conventional Energy Sources	The student will be able to provide detailed information of the present energy scenario and available NCES
C315.2		The student will be able to provide insight knowledge in basics of solar radiation geometry and various measurement techniques available.
C315.3		The student will be to explain solar thermal devices, PV conversion and their performance analysis and wind energy
C315.4		The student will be able explain the conceptual knowledge about the various energy conversion methods such as wind, Tidal, OTEC, Geothermal, Biomass and Hydrogen energy and their impact on environment and sustainability
C316.1	Remote Sensing & Gis	Collect data and delineate various elements from the satellite imagery using their spectral signature.
C316.2		Analyze different features of ground information to create raster or vector data.
C316.3		Perform digital classification and create different thematic maps for solving specific problems
C316.4		Make decision based on the gis analysis on thematic maps
C317.1	Control System Laboratory	To execute time response analysis of a second order system using MATLAB
C317.2		To analyze and interpret stability of the system through Root Locus and Bode plot.
C317.3		To design Lag, Lead, Lag-Lead compensators and verify experimental results using MATLAB
C317.4		To analyze speed-torque characteristics of DC and AC servomotors
C317.5		To analyze the effect of P, PI, PD and PID controllers on a control system
C318.1	Digital Signal Processing Laboratory	To understand the basics related to DSP and student should be able to compute and evaluate the DFT and IDFT of given DTS.
C318.2		Student should be able to compute and evaluate the DFT and IDFT of given DTS by DIT and DIF-FFT algorithms.
C318.3		To understand the basic related to analog filters and their design. Further students should able to design digital IIR and FIR filters and develop the computation structures of them.
C319.1	MINI-PROJECT	Students are going to enhance their knowledge in research & developmental activities.
C319.2		Students will improve their Communication (Oral & Written) skills & Presentation skills.
C319.3		Students will learn to work in team.
ADDON	Domestic Wiring	Able to understand wiring planning, conduction , testing and wiring safety precautions, energy star labeling
		Able to identify the problems and troubleshoot the domestic appliances
C401.1	Power System Analysis – 2	To formulate network matrices.
C401.2		To perform steady state power flow analysis of power systems using numerical iterative techniques.
C401.3		To show knowledge of optimal operation of generators on a bus bar.
C401.4		To perform numerical solution of swing equation for multi-machine stability
C402.1	Power System Protection	To explain construction and operating principles of different protective relays.
C402.2		To discuss protection of generators, motors, transformer and bus zone protection
C402.3		To explain the construction, operating principle of different types of circuit breakers.
C402.4		To discuss various fuses protection against over voltages and Gas Insulated Substation (GIS).
C403.1	Micro and Nano Scale Sensors &	Understand the differences between the sensor and transducer technology based on nanotechnology and nanofabrication and the classical sensor technologies.

C403.2	Transducers	Make an informed selection of a sensor or transducer for a particular application.
C403.3		Become knowledgeable about the technologies that are available commercially at the present time.
C403.4		Students will be able asses the stability of nonlinear system with the help of phase plane method.
C404.1	Utilization of Electrical Power	Discuss different methods of electric heating & welding.
C404.2		Discuss the laws of electrolysis, extraction, refining of metals and electro deposition process.
C404.3		Discuss the laws of illumination, different types of lamps, lighting schemes and design of lighting systems.
C404.4		Analyze systems of electric traction, speed time curves and mechanics of train movement
C404.5		Explain the motors used for electric traction, their control & braking and power supply system used for electric traction.
C405.1	Python Application Programming	Examine python syntax and semantics and be fluent in the use of python flow control and functions.
C405.2		Demonstrate proficiency in handling iterations, strings and file systems.
C405.3		Create, run and manipulate python programs using core data structures like lists dictionaries and use of regular expressions.
C405.4		Interpret the concepts of object oriented programming as used in python.
C405.5		Implement exemplary applications related to network programming, Web services and databases in python.
C405.1	Energy And Environment	Student will Understand energy scenario, energy sources and their utilization
C405.2		Students will learn about methods of energy storage, energy management and economic analysis
C405.3		Students will have proper awareness about environment and eco system
C405.4		Student will Understand the environment pollution along with social issues and acts.
C405.1	ARM Embedded Systems	Depict organization, architecture, bus technology, memory and operation of the ARM processors.
C405.2		Employee the knowledge of instruction set of ARM processors to develop basic assembly language programs.
C405.3		Recognize the ARM importance of the thumb mode operation of ARM processor.
C405.4		Describe the techniques in mold in writing c code for arm processors and exception and interrupt handling in arm processors.
C405.5		Describe the importance and use of firmware OS and cache in ARM embedded systems.
C406.1	PSS laboratory	Students will be able to create a MATLAB code to solve problems on transmission line performance, performance of synchronous generator and network matrices.
C406.2		Students will be able to use MiPower Software package to perform Load flow studies and Economical dispatch problem
C406.3		Students will be able to use Simulink to perform power system stability studies.
C407.1	Relay & HV lab	Experimentally verify the characteristics of over current, over voltage, under voltage and negative sequence relays both electromagnetic and static type.
C407.2		Show knowledge of protecting generator, motor and feeders.
C407.3		Analyze the spark over characteristics for both uniform and non-uniform configurations using High AC and DC voltages.
C407.4		Measure high AC and DC voltages and breakdown strength of transformer oil.
C407.5		Draw electric field and measure the capacitance of different electrode configuration models.
C408.1	Project Work Phase - 1	Students are going to enhance their knowledge in research & developmental activities.
C408.2		Students will improve their Communication (Oral & Written) skills & Presentation skills.
C408.3		Students will learn to work in team.
C409.1	Internship	Gain practical experience and acquire knowledge of the industry in which the internship is done, apply knowledge and skills learned in their academics.
C409.2		Develop a greater understanding about career options while more clearly defining personal career goal and experience the activities and functions of professionals.
C409.3		Develop and refine oral and written communication skills.
ADDON	PLC	To understand the basics of PLCs and ladder programming
		To understand the major instructions of ladder programming and illustrating them with programs
		To develop ladder logic for some real time applications

C409.1	Power System Operation and Control	To understand and explain the basics of power system operation, Architecture & configuration of SCADA
C409.2		To develop &analyze mathematical models of Automatic Load Frequency Control & Automatic Generation Control in Interconnected Power System
C409.3		To discuss Control of Voltage, Reactive Power & Voltage Collapse
C409.4		To explain security, contingency analysis, state estimation of power system
C410.1	Electrical Estimation and Costing	Understand the Role, legal issues , societal responsibilities of Estimator for safety of organization or industry or substation
C410.2		Understand Purchase orders, Tender form, Market Survey for Estimation and Costing, IE Rules and Acts .
C410.3		Understand wiring methods, types of cables used, Procedure of design of lighting points and sub-circuits, internal wiring, wiring accessories and fittings, fuses and types, layout information.
C410.4		Understand types of Service Main, Procedure of estimation of Service Mains and Power Circuits design and types of protection required for economic operation.
C410.5		Understand Specifications of Line Safety components, Procedure of estimation of overhead Transmission and Distribution system.
C410.6		Understand circuit elements of Substation like Earthling, Auxiliaries Supply, Lightning arrester, Circuit Breakers, CT, PT, and Procedure of Estimation of Substation Requirements.
C411.1	Project Work Phase - 2	Students are going to enhance their knowledge in research & developmental activities.
C411.2		Students will improve their Communication (Oral & Written) skills & Presentation skills.
C411.3		Students will learn to work in team.
C412.1	Technical Seminar	Attain, use and develop knowledge in the field of engineering and other disciplines through independent learning and collaborative study.
C412.2		Identify, understand and discuss current, real-time issues
C412.3		Improve oral and written communication skills.
C412.4		Explore an appreciation of the self in relation to its larger diverse social and academic contexts.
C412.5		Apply principles of ethics and respect in interaction with others.