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 AND ELECTRONICS ENGINEERING
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CO statement of 2021-25(2021 scheme)

Serial No	Subject name	Statement
C101.1	Calculus And Differential Equations	To apply the knowledge of calculus to solve problems related to polar curves and its applications in determining the bentness of a curve
C101.2		To learn the notion of partial differentiation to calculate rate of change of multivariate functions and solve problems related to composite functions and Jacobian.
C101.3		To solve first-order linear/nonlinear ordinary differential equations analytically using standard methods.
C101.4		To demonstrate various models through higher order differential equations and solve such linear ordinary differential equations.
C101.5		To test the consistency of a system of linear equations and to solve them by direct and iterative methods.
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 explain the laws used in the analysis of DC and AC circuits.
C103.2		To explain the behavior of circuit elements in single-phase circuits.
C103.3		To explain the generation of three-phase power and operation of three-phase circuits.
C103.4		To explain the construction and operation of transformers, DC generators and motors induction motors, and synchronous generators.
C104.1	Elements Of Civil Engineering & Mechanics	Understand the scope of various fields of civil engineering.
C104.2		Compute the resultant of a force system and resolution of a force.
C104.3		Comprehend the action for forces, moments, and other types of loads on rigid bodies and compute the reactive forces.
C104.4		Locate the centroid and compute the moment of inertia of regular and built-up sections.
C104.5		Analyze the bodies in motion.
C105.1	Engineering Visualization	Understand and visualize the objects with definite shape and dimensions
C105.2		Analyze the shape and size of objects through different views
C105.3		Analyze the 2D drawing and convert from Orthographic to Isometric or vice versa.
C105.4		Analyze the drawing and represent the components in different angle of projections.
C105.5		Identify the interdisciplinary engineering components or systems through its graphical representation.
C106.1	Engineering Physics Laboratory	To recognize the importance of light by exploring its interaction with matter and in realizing 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	Explain how to verify KCL and KVL for DC circuit and maximum power transfer theorem.
C107.2		explain power and power factor measurement of different types of lamps.
C107.3		explain the measurement of impedance for R-L circuits.
C107.4		explain the measurement of power consumed in a 3-phase load and efficiency , regulation of single phase transformer.
C107.5		explain methods of controlling a lamp from different places.
C108.1	Technical English – I	Understand and apply the Fundamentals of Communication Skills in their communication skills.
C108.2		Identify the nuances of phonetics, intonation and enhance pronunciation skills.
C108.3		To impart basic English grammar and essentials of language skills as per present requirement.
C108.4		Understand and use all types of English vocabulary and language proficiency.
C108.5		Adopt theTechniques of Information Transfer through presentation
C109.1	Innovation And Design Thinking	To explain the concept of design thinking for product and service development
C109.2		To explain the fundamental concept of innovation and design thinking
C109.3		To discuss the methods of implementing design thinking in the real world.
C110.1	Advanced Calculus And Numerical Methods	To solve first order linear/nonlinear differential equations analytically using standard methods
C110.2		Explain various physical models through higher order differential equations and solve such linear ordinary differential equations
C110.3		Understand a variety of partial differential equations and solution by exact methods/method of separation of variables
C110.4		Describe the applications of infinite series and obtain series solution of ordinary differential equations
C110.5		Apply the knowledge of numerical methods in the models of various physical and engineering phenomena
C111.1	Engineering Chemistry	Knowledge to discuss the electrochemical energy systems such as electrodes and batteries.
C111.2		Knowledge to Explain the fundamental concepts of corrosion, its control and surface modification methods namely electroplating and electroless platinge
C111.3		Knowledge to enumerate the importance, synthesis and applications of polymers. Understand properties and application of nanomaterials.
C111.4		Knowledge to describe the principles of green chemistry, understand properties and application alternative fuels.
C111.5		Knowledge to illustrate the fundamental principles of water chemistry, applications of volumetric and analytical instrumentation.
C112.1	Problem Solving Through Programming	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts.
C112.2		Apply programming constructs of C language to solve the real world problem
C112.3		Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting
C112.4		Explore user-defined data structures like structures, unions and pointers in implementing solutions
C112.5		Design and Develop Solutions to problems using modular programming constructs using functions
C113.1	Basic Electronics And Communication	Describe the concepts of electronic circuits encompassing power supplies, amplifiers and oscillators.

C113.2		Present the basics of digital logic engineering including data representation, circuits and the microcontroller system with associated sensors and actuators.
C113.3		Discuss the characteristics and technological advances of embedded systems.
C113.4		Relate to the fundamentals of communication engineering spanning from the frequency spectrum to the various circuits involved including antennas.
C113.5		Explain the different modes of communications from wired to wireless and the computing involved.
C114.1	Engineering Chemistry Laboratory	Knowledge in handling different types of instruments for analysis of materials using small quantitutes 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	Define the problem statement and identify the need for computer programming.
C115.2		Make use of C compiler, IDE for programming, identify and correct the syntax and syntactic errors in programming.
C115.3		Develop algorithm, flowchart and write programs to solve the given problem.
C115.4		Demonstrate use of functions, recursive functions, arrays, strings, structures and pointers in problem solving.
C115.5		Document the inference and observations made from the implementation.
C116.1	Scientific Foundation Of Health	: To Understand Health and wellness (and its Beliefs) and It's balance for positive mind-set.
C116.2		Develop healthy lifestyles for good health for their better Future
C116.3		Build a Healthy and caring relationships to meet the requirements good/social/Positive life
C116.4		To Learn about avoiding risks and harmful habits in their campus & outside the campus for their bright future
C116.5		prevent and fight against harmful diseases for good health through positive mindset
C117.1	Professional Writing Skills In English	To understand and identify the Common Errors in Writing and Speaking.
C117.2		To Achieve better Technical writing and Presentation skills.
C117.3		To read Technical proposals properly and make them to Write good technical reports.
C117.4		Acquire Employment and Workplace communication skills.
C117.5		To learn about Techniques of Information Transfer through presentation in different level.
C201.1	Transform Calculus, Fourier Series And Numerical Technics	To solve ordinary differential equations using Laplace transform.
C201.2		Demonstrate the Fourier series to study the behaviour of periodic functions and their applications in system communications digital signal processing and field theory.
C201.3		To use fourier transform to analyse problems involving continuous time signals and to apply z transform techniques to solve difference equations.
C201.4		To solve mathematical models represented by initial or boundary value problems involving partial differential equations.
C201.5		Determine the extreme functionals using calculus of variations and solve problem arising in dynamics of rigid bodies and vibration analysis.
C202.1	Analog Electronic Circuits And Op-Amps	Understand the operation and design of clipper, clamper and transistor amplifiers, switching circuits Compare transistor biasing circuits.
C202.2		Understand the operation, design and analyze the power amplifier circuits and oscillators for different Frequencies also Explain the concept of feedback, its types and design of feedback circuits.
C202.3		Understand the operation and characteristics of FET and MOSFET
C202.4		Understand and design op-amp applications like summing, scaling & averaging amplifier, first and second order filters, Signal generators, comparator and converter also analyze the various types of DC voltage regulators

C203.1	Electric Circuit Analysis	Able to analyze DC and AC circuits using various techniques
C203.2		Able to state and apply appropriate theorem for solving circuits.
C203.3		Able to perform resonant and transient analysis of simple circuits
C203.4		Able to analyze 3 phase circuits and determine parameters of two port networks.
C204.1	Transformer & Generators	Understand the constructional opertationof Single phase,Three phase, and auto transformer.
C204.2		Analyse the performance of transformers by polarity test,sumpners test, phase conversion,, three phase connections and parallel operation.
C204.3		Understand the construction and working of AC and DC generators
C204.4		Determine the regulation of AC generator by slip test, emf,mmf and zpf methods.
C204.5		Analyse the performance of AC generators on infinite bus and parallel operation.
	Electrical Machines Laboratory-I	Conducting different test on transformers and synchronous machines and evaluation of their performance.
C205.2		Verify the parallel operation of two single phase transformers.
C205.3		Study the connection of single phase transformers for three phase operation and phase conversion.
C205.4		Study of synchronous generator connected to infinite bus.
C206.1	Social Connect And Responsibility	Understand social responsibility
C206.2		Practice sustainability and creativity
C206.3		Showcase planning and organizational skills.
C207.1	Samskrutika Kannada	ಕನ್ನಡ ಭಾಷೆ ಸಾಹಿತ್ಯ ಸಂಸ್ಕೃತಿ ಮತ್ತು ನಾಡು ನುಡಿಯ ಪರಿಚಯವಾಗುತ್ತದೆ.
C207.2		ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳು ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಆಸಕ್ತಿ ಮೂಡುತ್ತದೆ.
C207.3		ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ.
C207.4		ಕನ್ನಡ ಭಾಷಾಭ್ಯಾಸ ಸಾಮಾನ್ಯ ಕನ್ನಡ ಹಾಗೂ ಆಡಳಿತ ಕನ್ನಡದ ಪದಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ.
C208.1	Circuit Laboratory Using Pspice	Simulation of electrical circuits to obtain voltage and current waveforms.
C208.2		Simulation of different circuit theorems
ADD on	Arduino	Students will be able to understand the basics of Arduino programming.
		Students interface different peripherals with Arduino.
C209.1	Complex Anal, Prob & Statistica	Use the concept of analytic function and complex potential to solve the problems arising in electromagnetic field theory. Utilise a confirm on transformation and complex integral arising in euro file theory fluid flow visualisation and image processing.
C209.2		Obtain series solution of ordinary differential equations.
C209.3		Use the concept of correlation and regression analysis to fit a suitable mathematical model for the statical data.
C209.4		Apply discrete and continuous probability distributions in analysing the probability models arising engineering field.
C209.5		Construct joint probability distributions and demonstrate the validity of testing the hypothesis.
C210.1	Digital system design	Develop simplified switching equation using Karnaugh Maps and Quine Mc-Clusky techniques.
C210.2		Design Multiplexer, Encoder, Decoder, Adder, Subtractors and Comparator as digital combinational control Circuits.
C210.3		Design flip flops, counters, shift registers as sequential control circuits.
C210.4		Develop Mealy/Moore Models and state diagrams for the given clocked sequential circuits.
C210.5		Explain the functioning of Read only and Read/Write Memories, Programmable ROM, EPROM and Flash Memory.
C211.1	Microcontroller	Outline the 8051 architecture, registers, internal memory organization, 8051 addressing modes.
C211.2		Discuss instruction set of 8051, accessing data and I/O port programming.

C211.3		Develop 8051C programs for time delay, I/O operations, I/O bit manipulation, logic and arithmetic operations, data conversion and timer/counter programming.
C211.4		Summarize the basics of serial communication and interrupts, also develop 8051 programs for serial data communication and interrupt programming.
C211.5		Program 8051to work with external devices for ADC, DAC, Stepper motor control, DC motor control.
C212.1	Electric Motors	Explain the construction, operation and classification of DC Motor, AC motor and special purpose motors.
C212.2		Describe the performance characteristics and applications of Electric motors.
C212.3		Demonstrate and explain the methods of testing of DC machines and determine losses and efficiency.
C212.4		Control the speed of DC motor and induction motor
C212.5		Explain the starting methods, equivalent circuit and phasor diagrams, torque angle, effect of change in excitation and change in load, hunting and damping of synchronous motors.
C213.1	Biology For Engineering	Elucidate the basic biological concepts via relevant industrial applications and case studies.
C213.2		Evaluate the principles of design and development, for exploring novel bioengineering projects.
C213.3		Corroborate the concepts of biomimetics for specific requirements.
C213.4		Think critically towards exploring innovative biobased solutions for socially relevant problems.
C214.1	Electrical Machine Laboratory -2	Students will be able to test DC machines to determine their characteristics and also to control the speed of DC motor.
C214.2		Students will be able to pre-determine the performance characteristics of DC machines by conducting suitable tests.
C214.3		Students will be able to perform load test on single phase and three phase induction motor to assess its performance.
C214.4		Students will be able to conduct test on induction motor to pre-determine the performance characteristics.
C214.5		Students will be able to conduct test on synchronous motor to draw the performance curves
C215.1	Constitution Of India & Professional Ethics	Analyse the basic structure of Indian Constitution,Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution.
C215.2		know about our Union Government, political structure & codes, procedures and Understand our State Executive & Elections system of India.
C215.3		Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.
C215.4		Professional ethics, types of , ethics , scope and aims of professional and engineering, ethics and responsibility of engineer.
C216.1	Scilab For Electrical & Electronic Measurement	Student will be able to design & analyze measurement of resistance, inductance & capacitance using various bridge arrangement
C216.2		Student will be able to design & analyze measurement of flux, flux density, frequency, power & energy of single phase & three phase circuits
C216.3		Student will be able to test & analyze current transformer & potential transformer
C216.4		Student will be able to design & analyze true rms reading voltmeter, digital voltmeter & Q meter
C217.1	Universal Human Values	To become more aware of themselves, and their surroundings (family,society, nature).
C217.2		To become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
C217.3		To have better critical ability.
C217.4		To become sensitive to their commitment towards what they have understood (human values, human relationship and human society).

C217.5		To apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.
C218.1	Inter/Intra Institutional Internship	Gain practical experience and acquire knowledge of the industry in which the internship is done, apply knowledge and skills learned in their academics
C218.2		Develop a greater understanding about career options while more clearly defining personal career goal and experience the activities and functions of professionals.
C218.3		Develop and refine oral and written communication skills.
ADD on	Electrical Vehicle And Simulation Of The Same Using Scilab	I have understood the electrical vehicle, evolution, different types, tractive efforts 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 plat form for modelling of various applications.
C301.1	Transmission And Distribution	Able to Explain transmission and distribution scheme, identify the importance of different transmission systems and types of insulators.
C301.2		Able to Analyze and compute the parameters of the transmission line for different configurations.
C301.3		Able to Assess the performance of overhead lines.
C301.4		Able to Interpret corona, explain the use of underground cables.
C301.5		Able to Classify different types of distribution systems; examine its quality & reliability.
C302.1	Control systems	Students will be able to define, classify control systems and form mathematical model of physical systems & determination of performance characteristics of AC/DC servomotor & synchro pair characteristics
C302.2		Students will be able to apply block diagram manipulation and signal flow graph method to obtain transfer function of system.
C302.3		Students will be able determine transient and steady state time response of a simple control system & utilize the software package in assessing time & frequency domain response of second order system
C302.4		Students will be able to discuss stability analysis using RH criterion, Root locus, bode plots and Nyquist plots & develop a script files to plot Root locus, Bode plot & Nyquist plot using software package
C302.5		Students will be able to design controller or compensator for given control system, design, analyze & simulate DC position control system, compensator & controllers. .
C303.1	Power System Analysis 1	Model the power system components & construct per unit impedance diagram of power system.
C303.2		Analyze three phase symmetrical faults on power system.
C303.3		Compute unbalanced phasors in terms of sequence components and vice versa, also develop sequence networks.
C303.4		Analyze various unsymmetrical faults on power system.
C303.5		Examine dynamics of synchronous machine and determine the power system stability.
C304.1	Power Electronics	To explain the overview of applications of power electronics, different types of power semiconductor devices & converters and characteristics of ideal & practical switches
C304.2		To discuss the characteristics of power diodes, their types and different types of diode rectifiers and their performance with various load combinations
C304.3		To explain the characteristics, limitations, types and base/gate drive requirements of different controlled devices such as Power Transistors and Thyristors
C304.4		To explain the design, analysis techniques, performance parameters and characteristics of different power electronic converters such as AC-DC, AC-AC, DC-DC, DC-AC converters
C305.1	Power Electronics Lab	To conduct experiment to study the characteristics of different power semiconductor devices such as SCRs, TRIACs, MOSFETs and IGBTs

C305.2		To demonstrate the different triggering methods of SCR using UJT relaxation oscillator and digital triggering circuit.
C305.3		To verify the performance of different Power Converters such as Controlled Full Wave Rectifier, AC Voltage Controller and PWM Inverter with R and RL loads
C305.4		Perform speed control of DC Motor, Universal Motor and Stepper Motor using suitable Power Converter
C306.1	Research Methodology & Intellectual Property Right	Did you Understood the knowledge on basics of research and its types.
C306.2		Did you Learn the concept of Literature Review, Technical Reading, Attributions and Citations.
C306.3		Did you learn Ethics in Engineering Research..
C306.4		Did you understood the concepts of Intellectual Property Rights in engineering.
C307.1	Environmental Studies	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale
C307.2		Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment
C307.3		Demonstrate ecology knowledge of a complex relationship between biotic and a biotic components
C307.4		Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues
C308.1	Renewable Energy Project	Course provide opportunity to perform the experiments/programmes at their own time, at their own pace, at any place as per their convenience and repeat any number of times to understand the concept.
C308.2		Provide unhindered access to perform whenever the students wish.
C308.3		Vary different parameters to study the behavior of the circuit without the risk of damaging equipment/ device or injuring themselves.
ADDON	Automotive Electronics	Implement various control requirement in the automotive system
		Identify various physical parameters that are to be sensed and monitored for maintaining the stability of the vehicle under dynamic condition.
		Understand and implement the controls and actuator system pertaining to the comfort and safety of commuters.
C309.1	Management	To explain the field of management, task of the manager, planning and steps in decision making
C309.2		To discuss the structure of organization, importance of staffing, leadership styles, modes of communication, techniques of coordination and importance of managerial control in business
C309.3		To explain the concepts of entrepreneurship and a businessman's social responsibilities towards different groups.
C309.4		To show an understanding of role of SSI's in the development of country and state/central level institutions/agencies supporting business enterprises.
C309.5		To discuss the concepts of project management, capital budgeting, project feasibility studies, need for project report and new control techniques
C310.1	Power System Analysis - 2	To formulate network matrices.
C310.2		To perform steady state power flow analysis of power systems using numerical iterative techniques.
C310.3		To show knowledge of optimal operation of generators on a bus bar.
C310.4		To perform numerical solution of swing equation for multi-machine stability
C310.5		Students will be able to create a Scilab code to solve problems on transmission line performance, performance of synchronous generator and network matrices
C310.6		Students will be able to use MiPower Software package to perform Load flow studies and Economical dispatch problem
C310.7		Students will be able to use Scilab/Xcos to perform power system stability studies.

C311.1	Signals And Digital Signal Processing	To understand about classification and basic operations that can be performed on both continuous and discrete time signals.
C311.2		To understand discrete Fourier Transform of a sequence and the convolution of two sequences to determine the output sequence and discrete Fourier Transform of a sequence by using fast methods
C311.3		To design Butterworth and Chebyshev IIR digital filters and FIR filters using different techniques.
C311.4		Develop different structures for IIR and FIR filters.
C312.1	Sensors And Transducers	To explain the need, classification, advantages & disadvantages of transducers.
C312.2		To explain the working of various transducers and sensors.
C312.3		To analyze the signal conditioning and signal conditioning equipment and to illustrate different configuration of Data Acquisition System and data conversion.
C312.4		To show knowledge of data transmission and telemetry.
C312.5		To explain measurement of non-electrical quantities.
C313.1	Remote Sensing & Gis	Collect data and delineate various elements from the satellite imagery using their spectral signature.
C313.2		Analyze different features of ground information to create raster or vector data.
C313.3		Perform digital classification and create different thematic maps for solving specific problems
C314.1	Non-Conventional Energy Sources	The student will be able to provide detailed information of the present energy scenario and available NCES
C314.2		The student will be able to provide insight knowledge in basics of solar radiation geometry and various measurement techniques available.
C314.3		The student will be to explain solar thermal devices, PV conversion and their performance analysis and wind energy
C314.4		The sudent will be able explainthe conceptual knowledge about the various energy cinversion methods such as wind, Tidal, OTEC, Geothermal, Biomass nad Hydrogen energy and their imapct on environment and sustanability
C315.1		Conduct sampling of signals in time and frequency domains
C315.2		Evaluate the impulse response of a system.
C315.3		Obtain convolution of given sequences to evaluate the response of a system.
C315.4	DSP Lab	Conduct sampling of signals in time and frequency domain
		Evaluate the response of a system
C315.5		Obtain formulation for the given sequences to evaluate the response of a system
C315.6		Compute DFT and IDFT of given sequence using basic definition and/or fast methods.
		Provide a solution for a difference equation
		Design and implement IIR and FIR filters.
C316.1	Mini Project	Students are going to enhance their knowledge in research & developmental activities
C316.2		Students will improve their Communication (Oral & Written) skills & Presentation skills
C316.3		Students will learn to work in team
C317.1	Societal Internship	Gain practical experience and acquire the knowledge of the industry in which the internship is done, apply knowledge and skills learned in their academic's.
C317.2		Develop greater understanding about career options while more clearly defining personal career goal and experience the activities and functions of professionals.
C317.3		Develop and refine oral and written communication skill.
addon	Plc	To explain PLC architecture, PLC ladder diagram programming
		To draw and write PLC ladder diagram and programming for applications using timers and counters
		To draw and write PLC ladder diagram and programming for math instructions, sequencers and shift register instructions.
C401.1	High Voltage And Power System Protection	Apply the knowledge of dielectric property for insulation, its performance as per standards and high voltage application in power system equipment.
C401.2		Analyse the circuit of high voltage, high currents in generation and measuremnts.
C401.3		Apply the relays to the power system protection

C401.4		Discuss protection of generator, motor, transformer and busbar protection.
C401.5		Discuss the construction, operating principles and performance of circuit breakers and describe the causes of over voltages and remedial measurement.
C402.1	Power System Operation And Control	To understand and explain the basics of power system operation, Architecture & configuration of SCADA
C402.2		To develop & analyze mathematical models of Automatic Load Frequency Control & Automatic Generation Control in Interconnected Power System
C402.3		To discuss Control of Voltage, Reactive Power & Voltage Collapse
C402.4		To explain security, contingency analysis, state estimation of power system
C403.1	Smart Grid	Student will able to explain role of different stakeholders in the design and development of smart grid , smart communication and measurement technologies, and performance analysis tools for smart grid design
C403.2		Student will able to explain different stability anlysis tools for smart grid.
C403.3		Student will able to explain different computational tools for smart grid design.
C403.4		Student will able to develop cleaner and more environmentally responsible technologies for electric system.
C403.5		Student will able to explain methods to promote smart grid awarenss and making the existing transmission system smarter by investing new technologies.
C404.1	Micro And Nano Scale Sensors & Transducers	Understand the differences between the sensor and transducer technology based on nanotechnology and nanofabrication and the classical sensor technologies.
C404.2		Make an informed selection of a sensor or transducer for a particular application.
C404.3		Become knowledgeable about the technologies that are available commercially at the present time.
C404.4		Students will be able asses the stability of nonlinear system with the help of phase plane method.
C405.1	Environmental Protection And Management	To explain measurement of non-electrical quantities.
C405.2		Collect data and delineate various elements from the satellite imagery using their spectral signature.
C405.3		Analyze different features of ground information to create raster or vector data.
C405.4		Perform digital classification and create different thematic maps for solving specific problems
C405.5		Students will be able asses the stability of nonlinear system with the help of phase plane method.
C406.1	E Waste Management	Understand the existing discourse on a e waste management , statics across the world, opportunities and challenges w.r.t. regulatory frame work. :SDG,CE,LCIA and MFA.
C406.2		Discribe EPR, regulatory framework for achiving specified goal across different countries and impact on environmental and human heatlh.
C406.3		Explain themes in the context of resource use and sustainable development. Urban mining , informal sector operation and need for resource use policy, financial support for recycling infrastructure building etc. in Indian context and also explain to what extent different aspects of e waste management have been incorporated in the existing regulatory frame work in comparison with international legislature.
C406.4		Identy and infer pan india initiative dealing with e waste management and ranging from building knowledge base through research and social action by different stakeholders to technologies and legal achievement and industrial initiative analyse road map for agenda 2030
C406.5		Use opportunities and challenges around four domains:legal and judicial domain, economic concern, recycling culture and environmental concern.
C407.1	Introduction To Non-Traditional Milling	Describe non-traditional machining process and compare it with Traditional machining process. Recognize the need for Non-traditional machining process.
C407.2		Describe the constructional features, performance parameters, process characteristics, applications, advantages, and limitations of USM, AJM and WJM.
C407.3		Characterize the need of Chemical and electro-chemical machining process along with the constructional features, process parameters, process characteristics, applications, advantages, and limitations

C407.4		Illustrate the constructional feature of the equipment, process parameters, process characteristics, applications, advantages and limitations EDM & PAM
C407.5		Understanding LBM equipment, LBM parameters, and characteristics. EBM equipment and mechanics of metal removal, applications, advantages and limitations LBM & EBM.
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.
C410.1	Technical Seminar	Attain, use and develop knowledge in the field of engineering and other disciplines through independent learning and collaborative study.
C410.2		Identify, understand and discuss current, real-time issues
C410.3		Improve oral and written communication skills.
C410.4		Explore an appreciation of the self in relation to its larger diverse social and academic contexts.
C410.5		Apply principles of ethics and respect in interaction with others.