SEMESTER	SUBJECT CODE	SUBJECT NAME	CO No.	COURSE OUTCOMES
S1	MAT 101	LINEAR ALGEBRA AND CALCULUS	CO1	Solve systems of linear equations, diagonalize matrices and characterise quadratic forms.
			CO2	Cmpute the partial and total derivatives and maxima and minima of multivariable functions
			CO3	Compute multiple integrals and apply them to find areas and volumes of geometrical shapes, mass and centre of gravity of plane laminas
			CO4	Perform various tests to determine whether a given series is convergent, absolutely convergent or conditionally convergent
			CO5	Determine the Taylor and Fourier series expansion of functions and learn their applications.
	PHT 100	ENGINEERING PHYSICS A	CO1	Compute the quantitative aspects of waves and oscillations in engineering systems.
			CO2	Apply the interaction of light with matter through interference, diffraction and identifythese phenomena in different natural optical processes and optical instruments
			CO3	Analyze the behaviour of matter in the atomic and subatomic level through the principles ofquantum mechanics to perceive the microscopic processes in electronic devices.
			CO4	Classify the properties of magnetic materials and apply vector calculus to static magneticfields and use Maxwell's equations to diverse engineering problems
			CO5	Analyze the principles behind various superconducting applications, explain the working ofsolid state lighting devices and fibre optic communication system
	EST 100	ENGINEERING MECHANICS	CO1	Recall principles and theorems related to rigid body dynamics
			CO2	Identify and describe the components of system of forces acting on the rigid body
			CO3	Apply the conditions of equilibrium to various practical problems involving different force system
			CO4	Choose appropriate theorems , principles or formulae to solve problems of mechanics
			CO5	Solve problems involving rigid bodies , applying the properties of distributed areas and masses
	EST 120	BASICS OF CIVIL &	CO1	Recall the role of civil engineer in society and to relate the various disciplines of Civil Engineering.

		MECHANICAL ENGINEERING	CO2	Explain different types of buildings, building components, building materials and building construction
			CO3	Describe the importance, objectives and principles of surveying.
			CO4	Summarise the basic infrastructure services MEP, HVAC, elevators, escalators and ramps
			CO5	Discuss the Materials, energy systems, water management and environment for green buildings.
	HUT 101	**LIFE SKILLS**	CO1	Define and Identify different life skills required in personal and professional life
			CO2	Develop an awareness of the self and apply well-defined techniques to cope with emotions and stress.
			CO3	Explain the basic mechanics of effective communication and demonstrate these through presentations.
			CO4	Take part in group discussions.
			CO5	Use appropriate thinking and problem solving techniques to solve new problems
			CO6	Understand the basics of teamwork and leadership
	PHL 120	**ENGINEERING PHYSICS LAB**	CO1	Develop analytical/experimental skills and impart prerequisite hands on experience forengineering laboratories
			CO2	Understand the need for precise measurement practices for data recording
			CO3	Understand the principle, concept, working and applications of relevant technologies andcomparison of results with theoretical calculations
			CO4	Analyze the techniques and skills associated with modern scientific tools such as lasers andfiber optics
			CO5	Develop basic communication skills through working in groups in performing the laboratoryexperiments and by interpreting the results
	ESL 120	**CIVIL & MECHANICAL WORKSHOP**	CO1	Name different devices and tools used for civil engineering measurements
			CO2	Explain the use of various tools and devices for various field measurements
			CO3	Demonstrate the steps involved in basic civil engineering activities like plot measurement, setting out operation, evaluating the natural profile of land, plumbing and undertaking simple construction work.

			CO4	Choose materials and methods required for basic civil engineering activities like field measurements, masonry work and plumbing.
			CO5	Compare different techniques and devices used in civil engineering measurements
			CO6	Identify Basic Mechanical workshop operations in accordance with the material and objects
			CO7	Apply appropriate Tools and Instruments with respect to the mechanical workshop trades
			CO8	Apply appropriate safety measures with respect to the mechanical workshop trades
S2	**MAT102**	**VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS**	CO1	Compute the derivatives and line integrals of vector functions and learn their applications.
			CO2	Evaluate surface and volume integrals and learn their inter-relations and applications.
			CO3	Solve homogeneous and non-homogeneous linear differential equation with constant coefficients .
			CO4	Compute Laplace transform and apply them to solve ODEs arising in engineering .
			CO5	Determine the Fourier transforms of functions and apply them to solve problems arising in engineering .
	CYT100	**ENGINEERING CHEMISTRY**	CO1	Apply the basic concepts of electrochemistry and corrosion to explore its possible applications in various engineering fields.
			CO2	Understand various spectroscopic techniques like UV-Visible, IR, NMR and its applications.
			CO3	Apply the knowledge of analytical method for characterizing a chemical mixture or a compound. Understand the basic concept of SEM for surface characterisation of nanomaterials.
			CO4	Learn about the basics of stereochemistry and its application. Apply the knowledge of conducting polymers and advanced polymers in Engineering.
			CO5	Study various types of water treatment methods to develop skills for treating wastewater
	EST110	**ENGINEERING GRAPHICS**	CO1	prepare multi view orthographic projections of objects by visualising them in different quadrants
			CO2	draw sectional views and develop surfaces of the Given object
			CO3	draw pictorial drawing using isometric principles and perspective projections to visualise objects in 3D

			CO4	convert 3D to orthographic view and vice-versa
			CO5	obtain multiview projections and solid models of objects using CAD tools
	EST 130	**BASICS OF ELECTRICAL ENGINEERING/BASIC ELEC:ENGG**	CO 1	Apply the fundamental laws of electrical engineering to solve simple ac circuits in steady
			CO 2	Develop and solve models of magnetic circuits
			CO 3	Apply the fundamental laws of electrical engineering to solve simple ac circuits in steady
			CO 4	Describe working of a voltage amplifier
			CO 5	Outline the principle of an electronic instrumentation system
	HUT102	**PROFESSIONAL COMMUNICATION**	CO 1	Develop vocabulary and language skills relevant to engineering as a profession
			CO 2	Analyze, interpret and effectively summarize a variety of textual content
			CO 3	Create effective technical presentations
			CO 4	Discuss a given technical/non-technical topic in a group setting and arrive at generalizations/consensus
			CO 5	Identify drawbacks in listening patterns and apply listening techniques for specific needs
			CO 6	Create professional and technical documents that are clear and adhering to all the necessary conventions
	EST102	**PROGRAMMING IN C**	CO1	Analyze a computational problem and develop an algorithm/flowchart to find its solution
			CO 2	Develop readable C programs with branching and looping statements, which uses Arithmetic, Logical, Relational or Bitwise operators
			CO 3	Write readable C programs with arrays, structure or union for storing the data to be processed
			CO 4	Divide a given computational problem into a number of modules and develop a readable multi-function C program by using recursion if required, to find the solution to the computational problem
			CO 5	Write readable C programs which use pointers for array processing and parameter passing
			CO 6	Develop readable C programs with files for reading input and storing output
	CYL120	**ENGINEERING CHEMISTRY LAB**	CO1	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various analyses
			CO2	Develop skills relevant to synthesize organic polymers and acquire the practical skill to use TLC for the identification of drugs

			CO3	Develop the ability to understand and explain the use of modern spectroscopic techniques for analysing and interpreting the IR spectra and NMR spectra of some organic compounds
			CO4	Acquire the ability to understand, explain and use instrumental techniques for chemical analysis
			CO5	Learn to design and carry out scientific experiments as well as accurately record andanalyze the results of such experiments.
			CO6	Function as a member of a team, communicate effectively and engage in further learning. Also understand how chemistry addresses social, economical and environmental problems and why it is an integral part of curriculum.
	ESL 130	**ELECTRICAL/ ELECTRONICS ENGINEERING WORKSHOP**	CO1	Apply fundamental concepts and circuit laws to solve simple DC electric circuits
			CO2	Develop and solve models of magnetic circuits
			CO3	Apply the fundamental laws of electrical engineering to solve simple ac circuits in steady state
			CO4	Describe working of a voltage amplifier
			CO5	Outline the principle of an electronic instrumentation system
			CO6	Explain the principle of radio and cellular communication
	MA 201	**LINEAR ALGEBRA AND COMPLEX ANALYSIS**	CO1	To equip the students with methods of solving a general system of linear equations.
			CO2	To familiarize them with the concept of Eigen values and diagonalization of a matrix which have many applications in Engineering.
			CO3	To understand the basic theory of functions of a complex variable and conformal Transformations.
S3	**EE 201**	**CIRCUITS AND NETWORKS**	CO1	Students will be able to apply circuit theorems to simplify and solve complex DC and AC electric networks.
			CO2	Students will be able to apply graph theory in solving networks.
			CO3	Students will be able to to apply Laplace Transform to find transient response.
			CO4	Students will be able to develop the representation of two-port networks using network parameters and analyse.
			CO5	Students will be able to gain the capability to synthesize a circuit for a particular purpose.

	EE 203	**ANALOG ELECTRONICS CIRCUITS**	CO1	Students will be able to design biasing scheme for transistor circuits
			CO2	Students will be able to model BJT and FET amplifier circuits
			CO3	Students will be able to choose a power amplifier with appropriate specifications for electronic circuit applications
			CO4	Students will be able to design & analyse oscillator circuits using BJT
			CO5	Students will be able to choose Operational amplifier(OPAMP) for specific applications including waveform generation
			CO6	Students will be able to design & implement analog circuits using OPAMPs
	EE 205	**DC MACHINES AND TRANSFORMER**	CO1	Students will be able to recall, write and recognize different types of DC machines and transformers.
			CO2	Students will be able to explain the working of DC machines and transformers.
			CO3	Students will be able to analyze, justify and compare the functioning of DC machines and transformers in different working conditions
			CO4	Students will be able to combine different basic principles of electrical engineering to apply on a practical situation
			CO5	Students will be able to identify and choose DC machines and transformers for different purposes and applications
	EE 207	**COMPUTER PROGRAMMING**	CO1	To impart knowledge about programming in C
			CO2	To learn basics of PYTHON.
	HS 200	**BUSINESS ECONOMICS**	CO1	Understand elementary principles of Economics and Business Economics.
			CO2	Analyze the various market situations with good grasp on the effect of trade cycle.
			CO3	Analyze the basic macro-economic concepts and monetary theory.
			CO4	Understand macro- economic concepts to improve their ability to analyses the business climate
			CO5	Analyze their employability by combining their technical knowledge with appropriate economic model
	EE 231		CO6	Attain knowledge of elementary accounting concepts used for preparing balance sheet and interpretation of balance sheets.

		ELECTRONIC CIRCUITS LAB	CO2	Students will be able to explain the working of electronic circuit.
			CO3	Students will be able to the analyze an electronic circuit
			CO4	Students will be able to create electronic circuits using multisim
			CO5	Students will be able to select and implement analog circuits using OPAMPs for a particular application
	EE 233	**PROGRAMMING LAB**	CO1	To impart knowledge and skills in programming
	MA 204	**PROBABILITY DISTRIBUTIONS, TRANSFORMS AND NUMERICAL METHODS**	CO1	To learn most of the important models of discrete probability distributions.
			CO2	To learn most of the important models of continuous probability distributions.
			CO3	To learn most of the important models of JOINT discrete and continuous probability distributions.
			CO4	To introduce the modern theory of probability and its applications to modelling and analysis and processing of random processes and signals.
			CO5	To learn Poisson processes and Markov Chains.
	EE 202	**SYNCHRONOUS AND INDUCTION MACHINES**	CO1	Students will be able to differentiate the different types of Synchronous machines and types of AC armature windings.
			CO2	Students will be able to demonstrate knowledge on importance of Voltage regulation of Alternators and how to pre-determine the voltage regulation of Synchronous machines in laboratory.
			CO3	Students will be able to acquire knowledge on how Alternators can be paralleled to Infinite bus and how loads can be shared.
			CO4	Students will be able to understand all about Synchronous Motors and applications of various starting methods. Students will be able to differentiate the different types of Induction machines
			CO5	Ability to analyse the performance of induction machines inorder to implement in household and industrial applications.
			CO6	Will acquire knowledge on performance characteristics of synchronous induction motors relating the features of synchronous machines and induction machines. Ability to differentiate different types of single phase Induction motors
S4	**EE204**	**DIGITAL ELECTRONIC**	CO1	Students will be able to distinguish the different number systems and be able to convert from one form to other.
			CO2	Students will be able to use the laws of Boolean algebra to simplify circuits.

		S AND LOGIC DESIGN	CO3	Students will be able to design combinational and sequential circuits.
			CO4	Students will be able to define the significance of state machines.
			CO5	Students will be able to interpret programmable logic circuit devices and it's usage.
	EE 206	**MATERIAL SCIENCE**	CO1	To describe the characterestics of conducting and semi conducting materials
			CO2	To classify magnetic materials and describe different laws related to them
			CO3	To classify different insulators and explain behaviour of dielectrics
			CO4	To describe mechanisms of BD in solids,liquids and gases
			CO5	To describe solar energy materials and superconducting materials
			CO6	Gain knowledge in modern Techniques for material studies
	EE 208	**MEASUREMENTS AND INSTRUMENTATION**	CO1	Compare different types of instruments, their working principles advantages and disadvantages.
			CO2	Explain the operating principles of various ammeters, voltmeters and ohm meters
			CO3	Measure single phase & three phase power using wattmeters.
			CO4	Summarize different flux and permeability measurements methods
			CO5	Differentiate AC potentiometers and bridges
			CO6	Explain the working and applications of cathode ray oscilloscope
	HS 210	**LIFE SKILLS**	CO1	Communicate Effectively
			CO2	Make Effective Presentations
			CO3	Write different types of reports
			CO4	Face Interview and Group Discussion
			CO5	Critically think on a particular problem
			CO6	Solve Problems
			CO7	Work in groups and teams
			CO8	Handle engineering ethics and human values
			CO9	Become an effective leader
	EE 232	**ELECTRICAL MACHINES LAB 1**	CO1	Students will be able to predict the performance of DC machines and Transformers using standard equivalent circuit models
			CO2	Students will be able to select the appropriate machines based on the application requirements

			CO3	Students will be able to illustrate laboratory data and experimental results using graphical representations
			CO4	Students will work in teams to conduct experiments, analyze results, and develop technically sound reports of outcomes
			CO5	Students will be able to identify faults occurring in machines and take necessary corrective measures
	EE234	CIRCUITS AND MEASUREMENTS LAB	CO1	Analyse voltage current relations of RLC circuits
			CO2	Verify DC network theorems by setting up various electric circuits.
			CO3	Measure power in a single and three phase circuits by various methods
			CO4	Calibrate various meters used in electrical systems
			CO5	Determine magnetic characteristics of different electrical devices
			C06	Analyse the characteristics of various types of transducer systems
			CO7	Determine electrical parameters using various bridges
			CO8	Analyse the performance of various electronic devices for an instrumentation systems and, to develop the team management and documentation capabilities.
S5	EE301	POWER GENERATION TRANSMISSION & PROTECTION	CO1	Know the various conventional and non conventional method of power generation and the concepts of economics of power generation
			CO2	Understand the various transmission line parameters and line constants
			CO3	know the mechanical design of overhead lines and underground cables.
			CO4	Understand about HVDC, FACTS and various types of distribution systems.
			CO5	Understand the need of powersystem protection and protective relays
			CO6	Know about the protection of alternators transformers, transmission lines and also the causes of over voltages
	EE 303	LINEAR CONTROL SYSTEMS	CO1	Students will be able to explain the various practices of modelling physical systems.
			CO2	Students will be able to differentiate between various control system components and will be able to explain the time domain specifications.
			CO3	Students will be able to develop basic knowledge in error and stability analysis
			CO4	Students will be able to compare and analyse the stability of the systems - thereby having a more realistic approach towards the design of Control systems

			CO5	Students will be able to classify and understand the various frequency domain analysis techniques in control systems.
	EE 305	**POWER ELECTRONICS**	CO1	Students will be able to choose appropriate power semiconductor device in converter circuits and develop their triggering circuits.
			CO2	Students will be able to analyze various types of power electronic converters and apply different switching techniques
			CO3	Students will be able to select appropriate power converter for specific applications
			CO4	Students will be able to interpret and use datasheets of power semiconductor devices for design.
	EE 307	**SIGNALS AND SYSTEMS**	CO 1	
			CO 2	Students will be able to analyse the continuois time systems with Laplace Transform
			CO 3	Students will be able to represent and analyse signals using Fourier representation
			CO 4	Students will be able to analyse the discrete time signals using Z Transform
			CO 5	Students will be able to analyse the DT systems with DFS and acquire basic knowledge in non linear system
	EE 309	**MICROPROCESSOR AND EMBEDDED SYSTEMS**	CO1	Student is able to describe different addressing modes of operations of a typical 8085 microprocessor
			CO2	Student is able to design and develop 8085 assembly language programs using software interrupts and various assembler directives.
			CO3	Student is able to develop Interface microprocessors with Devices like ADC, LED, DAC
			CO4	Student is able to analyze and compare the features of microprocessors and microcontrollers.
			CO5	Student is able to design and develop assembly language programs using 8051 microcontroller
	EE 367	**NEW AND RENEWABLE ENERGY SYSTEMS**	CO1	Students will be able to recognize and understand the world and Indian energy scenario and necessity of sustainable development utilising Renewable Energy recourses
			CO2	Students will be able to analyse and infer the potentials and design systems based on solar thermal systems.
			CO3	Students will be able to illustrate, design and implement solar electric systems.
			CO4	Students will be able to understand the fundamentals and interpret basic components of energy from the ocean

			CO5	Students will be able to understand the fundamentals and interpret basic components of energy from the wind
			CO6	Students will be able to understand the fundamentals and interpret basic components of energy from the biomass and emerging technologies
		DIGITAL CIRCUITS AND EMBEDDED SYSTEMS	C01	Design, setup and analyse various digital circuits.
			CO2	Students will be able to program and explain 8085 microprocessor for different applications
			CO3	Students will be able to program and use advanced microprocessors
			CO4	Students will be able to program and interface 8051 microcontroller
	EE 331		CO5	Students will be able to combine different system for a practical applications
		ELECTRICAL MACHINES LAB II	CO1	Students will be able to understand various starting methods and to select appropriate machines based on the application requirements.
			CO2	Students will be able to predict the performance of Induction machines using standard equivalent circuit models.
			CO3	Students will be able to obtain various losses in electrical machines so that they can able to adopt methods to improve efficiency.
			CO4	Students will be able to understand various regulation methods that can be adopted in Alternators
	EE 333		CO5	Student will be able to understand performance of Synchronous motor in various load conditions.
		ADVANCED CONTROL THEORY	CO1	Students will be able to design compensators in time domain
			CO2	Students will be able to design compensators in frequency domain
			CO3	Students will be able to acquire the fundamental knowledge about state space modelling
			CO4	Students will be able to design controllers and observers and thereby acquire full knowledge about the stability of systems
	EE304		CO5	students will be able to acquire knowledge about the nonlinear systems
		POWER SYSTEM ANALYSIS	CO1	concepts of fault analysis using symmetrical and sequence networks
			CO2	Compute symmetrical and unsymmetrical fault studies
			CO3	Load flow solution using different iterative methods
			CO4	Modelling of single and two area system of frequency control
S6	EE306		CO5	Study of economics of load despatch

			CO6	Studu of steady and transient stability in the power system network
	EE302	**ELECTROMAGNETICS**	CO1	Define different coordinate system and apply them to analyze fields & potentials due to static charges
			CO2	Explain the physical meaning of the differential equations for electrostatic and magnetic fields.
			CO3	Understand how materials are affected by electric and magnetic fields.
			CO4	Understand the relation between the fields under time varying situations.
			CO5	Understand principles of propagation of uniform plane waves
			CO6	Be aware of electromagnetic interference and compatibility
	EE 308	**ELECTRIC DRIVES**	CO1	Students will be able to analyse a drive being applied in 4 different quadrants
			CO2	Students will be able to apply drives being used in real applications
			CO3	Students will be able to understand the various speed control techniques used in the control of the machine.
			CO4	Students will be able to to understand the concept for DC drive
			CO5	Students will be able to to understand the concept of speed control for AC drives
	HS 300	**PRINCIPLES OF MANAGEMENT**	CO1	To recall and identify the relavance of management concepts
			CO2	To discribe, discuss and relate management techniques adopted within an organization.
			CO3	To apply management techniques for meeting current and future management challenges faced by an organization.
			CO4	To compare the management theories and models critically and to inspect and question its validity in the real world.
			CO5	To access and modify different theories of management so as to relate it to current management challenges.
			CO6	To apply principles of management inorder to execute the role as a manager.
	EE372	**BIOMEDICAL INSTRUMENTATION**	CO1	To provide an introduction to BMI
			CO2	To provide an introduction to biopotential electrodes
			CO3	To give awareness of measurement of blood pressure and heart sounds
			CO4	To give insight of cardiac pacemakers, defibrillators, EEG, EMG, etc

			CO5	To provide awareness of ventilators, X-rays, MRI etc.
			CO6	To gain knowledge in instruments for lab, safety, shock hazards and tele medicine
	EE 366	**ILLUMINATION TECHNOLOGY**	CO1	Understand the fundamentals and architectural design of Illumination Engineering.
			CO2	Enable to understand the design of interior lighting
			CO3	Understand the design of Outdoor lighting.
			CO4	Understand various aspects of Aesthetic Lighting.
S7	**EE401**	**ELECTRONIC COMMUNICATION**	CO1	Understand the need of modulation in transferring a signal through either wireless or wired communication systems
			CO2	Be able to apply analog modulation techniques and receiver fundamentals in analog communication.
			CO3	Be to apply baseband digital encoding & decoding techniques in the storage / transmission of digital signal through wired channel
			CO4	Understand the basic concept of cellular and satellite communication systems
			CO5	Understand the performance of communication systems in the presence of noise and interference
	EE403	**DISTRIBUTED GENERATION &SMART GRIDS**	CO1	Understand the concepts of microgrid, smartgrid and various distributed generation systems.
			CO2	Understand the different types of storage devices and the control schemes of microgrids.
			CO3	Explain the Smart grid architecture, Smart sensors and tariff
			CO4	Understand the various aspects of energy management.
			CO5	Explain the different substation automation schemes and architecture.
			CO6	Explain the aspects of power quality and understand the sources of harmonics
	EE405	**ELECTRICAL SYSTEM DESIGN**	CO1	Get aware of the Acts and rules regulating the design of electrical systems in India.
			CO2	Understand the design and testing of domestic installations as per NEC guidelines.
			CO3	Understand the design of industrial installations and substations upto 630 kVA
			CO4	Design the earthing of substations up to 630 kVA and to get aware of pre-commissioning tests to be conducted in cables and transformers.

			CO5	Design of interior and exterior illumination systems. Design requirements of high rise buildings and recreational buildings.
			CO6	Know the various energy conservation techniques in lighting and power. Selection of standby generator .Introduction to Automatic Main Failure and solar PV systems.
	EE407	**DIGITAL SIGNAL PROCESSING**	CO1	analyse DT systems with DFT
			CO2	Design digital filters
			CO3	analyse finite word length effects
			C04	understand digital Signal processors and their applications
			CO5	understand Matlab FDA toolbox
	EE409	**ELECTRICAL MACHINE DESIGN**	C01	Interpret electrical and magnetic design considerations of Electrical machines.
			CO2	Design single and three phase transformers with respect to core dimensions and windings
			CO3	Design DC machines based on main dimensions and field winding design
			CO4	Design of synchronous machines with respect to its main dimensions and turbo alternators.
			CO5	Design of three phase inductions motors with respect to main dimensions and end rings
			CO6	Explanation of CAD and FEM
	EE469	**ELECTRIC HYBRID VEHICLES**	CO1	Design and develop basic schemes of electric vehicles and hybrid electric vehicles
			CO2	Choose a suitable drive scheme for developing an electric hybrid vehicle depending on resources
			CO3	Choose proper energy storage systems for vehicle applications
			CO4	Identify various communication protocols and technologies used in vehicle networks.
	EE431	**POWER SYSTEM LAB**	CO1	impact practical knowledge about various Power system components
			CO2	acquire knowledge about the operation of power system
			CO3	simulate the power system operations which will be helpful in the design of power systems
			CO4	introduce the various testing procedures in power system
S8	EE402	**SPECIAL**	CO1	Identify alternator types, and appreciate their performance
			CO2	Determine the voltage regulation and analyze the performance of alternators
			CO3	Describe the principle of operation of synchronous motor and different applications

		ELECTRIC MACHINES	CO4	Describe the principle of operation of 3-phase induction motors and select appropriate motor types for different applications
			CO5	Analyse the performance of 3-phase induction motors
	EE404	**INDUSTRIAL INSTRUMENTATION &AUTOMATION**	CO1	Familiarize with principle of operation and application of 1-phase induction motors
			CO2	Select instruments and transducers for measurement of various physical variables.
			CO3	Get an insight on data acquisition, processing and monitoring system
			CO4	Design various signal conditioning systems for transducers.
			CO5	Understand the concepts of virtual instrumentation and basic programming logic of PLCs
	EE406	**ENERGY MANAGEMENT *AUDITING**	CO 1	Understand the concepts of energy management and energy management opportunities. Various methods of peak demand control and optimal load scheduling
			CO 2	Enable to understand the various energy conservation opportunities in boiler.
			CO 3	To understand various energy conservation opportunities in HVAC systems. Energy saving opportunities of waste heat recovery.
			CO 4	To understand various aspects of Energy Auditing and various Procedures.
			CO 5	To Know different methods used for the economic analysis of various energy projects
	CE488	**DISASTER MANAGEMENT**	CO1	The students will get general ideas about the processes involved in natural disasters
			CO2	The students will get general ideas about the processes involved in anthropogenic disasters
			CO3	The students will understand the concepts of disaster management
			CO4	The students will understand the measures to mitigate and contain common episodes of disasters
M1	**01MA6021**	**Advanced Mathematics & Optimization Techniques**	CO1	
			CO2	
			CO3	
			CO4	
			CO5	
	01EE6101	**Dynamics of Linear Systems**	CO1	To provide a strong foundation on classical and modern control theory
			CO2	To provide an insight into the role of controllers in a system

			CO3	To design compensators using classical methods
			CO4	To design controllers in the state space domain
			CO5	To impart an indepth knowledge in observer gain
	01EE6103	**Digital Control Systems**	CO1	Introduce the concepts of digital control of dynamic systems
			CO2	To design dynamic systems using transform techniques and state space methods
			CO3	To design compensators using classical methods and analysis of closed loop stability
			CO4	To impart indepth knowledge in state space design of digital controllera and observers
			CO5	To analyse the system performance and stability aspects with controllers and observers in closed loop
	01EE6303	**Power Electronic Circuits**	CO1	Students will be able to develop a deep knowledge of Power Semiconductor Devices, Power Electronic Circuits and their applications.
			CO2	Students will be able to analyse AC/DC and DC/AC converters
			CO3	Students will analyse DC/DC converters
			CO4	Students develop skills to use Power Electronic Circuits in energy conversion system
			CO5	Students will acquire skills to apply Power Electronic Circuits in Power Converters to improve the performance and efficiency.
	01EE6203	**Introduction to Flight**	CO1	students will have knowledge of standard atmosphere
			C02	to induct fundamental concepts of basic aerodynamics and aerodynamic shapes
			C03	general idea of airplane performance
			C04	to get general awareness about stability and control
			C05	to study about aerodynamic performances
	01EE6999	**Research Methodology**	**CO1**	Understand research concepts in terms of identifying the research problems
			CO2	Propose possible solutions based on research
			CO3	Write a technical paper based on findings
	01EE6191	**Seminar I**	CO1	Identifying the current topics in the specified stream
			CO2	Collect the recent publications related to the identified topics
			CO3	Do a detailed study of a selected topic based on current journals,published papers and books

			CO4	Present a seminar on the selected topic on which a detailed study has been done
			CO5	Improve the writing and presentation skills
	01EE6193	Design & Simulation Lab	CO1	Students will be able to analyse systems using classical and modern control theory using MATLAB/SIMULINK
			CO2	Students will be able to design, simulate and evaluate control systems
			CO3	Students will be able to design & fine tuning of PID controller and familiarize the roles of P, I and D in feedback control
			CO4	Students will be able to acquire ability to critically analyze different dynamic systems and choose a suitable controller.
			CO5	Students will be able to get exposure to aspects of control systems design.
M2	01EE6102	Optimal Control Theory	CO1	To choose a suitable performance measure to meet the specific requirements for a typical optimal control problem
			CO2	To equip the students to formulate optimal control problems
			CO3	Familiarize the concepts of calculus of variation
			CO4	To analyse the physical system by applying constrained optimisation
			CO5	To design the controller by optimizing the suitable performance criteria by satisfying the constraints over the state and inputs.
	01EE6104	Nonlinear Control Systems	CO1	To study the essentials of non linear system
			CO2	To understand the behaviour of systems that can be described by non linear ordinary differential equations
			CO3	To extend the analysis technique for classical control theory to non linear system
			CO4	To analyse the physical system with inherent no linearity for stability and performance
			CO5	To provide the necessary methods for designing controller for non linear systems
	01EE6412	New and Renewable Sources of Energy	CO1	Students will be able to recognize and understand the world and Indian energy scenario and necessity of sustainable development utilising Renewable Energy recourses
			CO2	Students will be able to analyse and infer the potentials and design systems based on solar thermal systems
			CO3	Students will be able to illustrate, design and implement solar electric systems

			CO4	Students will be able to understand the fundamentals and interpret basic components of energy from the ocean
			CO5	Students will be able to understand the fundamentals and interpret basic components of energy from the wind
			CO6	Students will be able to understand the fundamentals and interpret basic components of energy from the biomass and emerging technologies
	01EE6432	**Sustainable and Translational Engineering**	CO1	To give explanation of history and emergence of sustainable development
			CO2	To give awareness of industrialization and globalisation
			CO3	To make aware of Global environmental issues
			CO4	To get an idea of wasteland reclamation
			CO5	To give an insight of different energy sources
			CO6	To be able to give description of Green buildings, Green Engineering, Industrial Ecology etc.
	01EE6214	**Flight Dynamics and Control**	CO1	to be able to develop the point mass model of an aircraft
			C02	to be able to understand the Dynamics ofan aircraft
			CO3	to analyse the performance of aircrafts
			C04	to be able to analyse the stability issues of an aircr aft
	01EE6192	**Mini Project**	CO1	to be capable of designing and developing system prototypes
			CO2	to be able for utilizing latest softwares and equipments
			CO3	Intellectual capability and innovative thinking of the students are ignited
			CO4	Students are facilitated to probe into or identify technical issues
	01EE6194	**Advanced Control Lab**	CO1	Realise different compensators
			CO2	Familiarize P,PI and PID controllers
			CO3	Design and implement PID controller and familiarize the role of P,I and D in fredback controller
			CO4	Practice of control system design in inverted pendulum system which is widely used as a benchmark for testing control algorithm
			CO5	Implementation of real time controller for dynamic systems
M3	**01EE7111**	**Robust Control**	CO1	students will be able to Identify different uncertainties and to model the uncertainties

			CO2	students will be able to apply different approaches for analysing robust stability and robust performance
			CO3	students will be able to design robust controllers for physical systems and compare with other controllers
	01EE7121	**Biomedical Instrumentation**	CO1	TO give an idea of human physiology and different type of Transducers
			CO2	To give awareness of electrical potentials and biomaterials used in BMI
			CO3	To get knowledge in measurement of electrical activities and ECG,EEG,EMG etc
			CO4	To get insight of measurement of blood flow and Therapeutic equipment
			CO5	T o get idea about BMI signal processing and image processing
			CO6	To give deep knowledge in Instrumentation for clinical laboratory
	01EE7191	**Project Phase 1**	CO1	Student should be able to identify the topic, objectives and methodology to carry out the project.
			CO2	Student should be able to finalize the project plan for their course project.
	01EE7193	**Seminar**	CO1	Student should be able to get good exposure in the current topics in the specific stream.
			CO2	Student should be able to improve the writing and presentation skills.
			CO3	Student should be able to explore domains of interest so as to pursue the course project.
M4	**01EE7194**	**Project Phase II**	CO1	Student should be able to get a good exposure to a domain of interest.
			CO2	Student should be able to get a good domain and experience to pursue future research activities.