COURSE CODE	COURSE NAME	COURSE OUTCOMES
HS6151	TECHNICAL ENGLISH – I	CO1.Apply the collaborative and social aspects of research and writing processes.
		CO2.Comprehend that research and writing is a series of tasks, including accessing, retrieving, evaluating, analyzing and synthesizing appropriate data and information from sources that vary in content, format, structure and scope.
		CO3.Use appropriate technologies to organize, present and communicate information to address a range of audiences, purposes and genres.
		CO4.Explain the relationships among language, knowledge and power including social,cultural, historical and economic issues related to information, writing and technology.
		CO5.Demonstrate the role of a variety of technologies/ media in accessing, retrieving, managing and communicating information.
MA6151	MATHEMATICS – I	CO1.Find the eigen values and eigen vectors to diagonalise and reduce a matrix to quadratic form.
		CO2.Check the converges, diverges of infinite series.
		CO3.Obtain the evaluate and envelopes of a given curves by means of radius and centre
		CO4.Calculate the maxima and minima value functions of two variables
		CO5.Find the area of plain curves and volume of solid using double and triple integrals
PH6151	ENGINEERING PHYSICS – I	CO1.Classify the Bravais lattices and different types of crystal structures and growth technique.
		CO2.Demonstrate the properties of elasticity and heat transfer through objects.
		CO3.Explain black body radiation, properties of matter waves and Schrodinger wave equations.
		CO4.Illustrate the acoustic requirements, production and application of ultrasonics
		CO5.Examine the characteristics of laser and optical fiber.
CY6151	ENGINEERING CHEMISTRY I	CO1.Classify the polymers and their utility in the industries and describe the techniques of polymerization & properties of polymers.
		CO2.Relate various thermodynamic functions such as enthalpy, entropy, free energy and their importance and equilibrium constant and its significance.
		CO3.Characterize the photophysical processes such as fluorescence and phosphorescence and various components of UV & IR spectrophotometer.
		CO4.Analyze the phase transitions of one component and two component systems and the types of alloys and their application in industries.
		CO5.Describe the synthesis, characteristics and the applications of nano materials.
GE6151	ENGINEERING GRAPHICS	CO1.Sketch the conic sections, special curves, and draw orthographic views from pictorial views and models.
		CO2.Apply the principles of orthographic projections of points in all quadrants, lines and planes in first quadrant.
		CO3.Sketch the projections of simple solids like prisms, pyramids, cylinder and cone and obtain the traces of plane figures
		CO4.Practice the sectional views of solids like cube, prisms, pyramids, cylinders & cones and extend its lateral surfaces
		CO5.Sketch the perspective projection of simple solids, truncated prisms, pyramids, cone and cylinders and sketch the isometric projection of simple machine parts.
GE6151	FUNDAMENTALS OF COMPUTING AND PROGRAMMING	CO1.Implement the organization of digital computer and number system,flow chart to solve basic problems.
		CO2.Develop and manage simple application in C using basic construct.
		CO3.Design and Implement to work array and string.
		CO4.Develop and Implement application related to good modular design using function and pointer.
		CO5.Develop application in C using structure and union.

GE6161	COMPUTER PRACTICES LABORATORY	CO1.Prepare data using MS-word & Excel to visualize graphs, charts in MS-Excel.
		CO2.Outline the given problem using flowchart and to program using Switch case & Control structures.
		CO3.Develop the code using decision making & looping statements.
		CO4.Apply passing parameters using Arrays & Functions.
		CO5.Use structure and Union for a given database and to bring out the importance of Unions over structure.
GE6162	ENGINEERING PRACTICES LABORATORY	CO1.Fabricate carpentry components and pipe connections including plumbing works
		CO2.Calculate the different Electrical quantities, measure the energy consumption using single phase energy meter.
		CO3.Demonstrate wiring for a simple residential house, identify the ratings of various appliances like Fluorescent tube, incandescent lamp, etc.
		CO4.Explain the basic electronic components , gates and soldering practices
		CO5.Develop soldering in a PCB, measure ripple factor of Half Wave Rectifier and Full Wave Rectifier..
GE6262	PHYSICS AND CHEMISTRY LABORATORY	CO1.Evaluate the wavelength of spectral lines using spectrometer, the wavelength of laser, particle size, acceptance angle of an optical fiber using semiconductor diode laser and the thickness of a thin wire through interference fringes using Air
		CO2.Appraise the velocity of sound and compressibility of the liquid using ultrasonic interferometer and thermal conductivity for bad conductors using Lee's disc apparatus.
		CO3.Determine the DO content in water sample by winkler's method and molecular weight of polymer by Ostwald viscometer
		CO4.Find the strength of an acid using pH meter and conductometer.
		CO5.Estimate the amount of weak and strong acids in a mixture by conductometer.
HS6251	TECHNICAL ENGLISH- II	CO1.speak clearly, confidently, comprehensibly, and communicate with one or many people.
		CO2.Write cohesively and coherently and flawlessly avoiding grammatical errors, using a wide vocabulary range, organizing their ideas logically on a topic.
		CO3.Read different genres of texts adopting various reading strategies.
		CO4.Listen/view and comprehend different spoken discourses/excerpts in different accents
		CO5.Recognize, understand, and analyze the context within which language, information, and knowledge are produced, managed, organized, and disseminated.
MA6251	MATHEMATICS- II	CO1.Find solenoidal, irrotational vectors and explain the concepts of Green's, Gauss divergence , Stokes theorem to evaluate, single double and triple integrals
		CO2.Obtain the P.I. of Cauchy and Legendre Equation , explain the method of variation of parameters and solve simultaneous linear equations
		CO3.valuate Laplace Transforms of periodic functions and solve the ODE using Inverse Laplace Transform
		CO4.Recall the properties of analytic functions for verifying C-R equations and determine Bilinear Transformation
		CO5.Expand functions of two variables as Taylor's and Laurent's series and evaluate Contour integrals using Cauchy's Integral formula
PH6251	ENGINEERING PHYSICS- II	CO1.Illustrate classical and quantum free electron theory and calculate carrier concentration in metals.
		CO2.Describe the carrier concentration in semi conductors and identify the p-type and n-type semi conductor using hall effect.
		CO3.Classify the different types of magnetic and super conducting materials.
		CO4.Explain the dielectrics, types of polarization, losses and breakdown.
		CO5.Discuss the properties, preparation and applications of metallic alloys, SMA,nano materials, NLO, Bio-materials.
CY6251	ENGINEERING CHEMISTRY – II	CO1.Explain the problems of using hard water in boilers and the methods of treatment of water for boiler use.
		CO2.Design the electrochemical cells and to identify the types of corrosion and the methods of preventing.
		CO3.Illustrate the methods of harnessing energy from non-conventional energy
		CO4.Classify various engineering materials and their importance.
		CO5.Relate the significance of solid, liquid and gaseous fuels and to calculate the calorific values of fuels and the requirement of air for combustion in furnaces.

GE6251	BASIC CIVIL AND MECHANICAL ENGINEERING	CO1.Explain the working principles of various power plants and differentiate the pumps and turbines.
		CO2.State the functions of IC engine and classify the various types of boilers.
		CO3.Apply the principles of vapour absorption and compression systems and Explain the Operation of air conditioner.
		CO4.Apply the principles of surveying and use various measurements for surveying and study about various engineering materials and leveling instruments.
		CO5.Classify the types of bridges, foundation, floorings, roofs, plasters and R.C.C structural members and state the purpose of dam.
EE6201	CIRCUIT THEORY	CO1.Understand the Concepts of Electric Circuits and to analyze the electric circuits.
		CO2.Apply the knowledge on electric circuits on solving circuit equations using network theorems
		CO3.Ability to evaluate the transient response of circuits.
		CO4.Ability to explain the concepts of phasor diagrams and analyse the three phase circuits
		CO5.Analyze resonant and coupled circuits.
GE6262	PHYSICS AND CHEMISTRY LABORATORY- II	CO1.Appraise the Young's modulus of the beam by uniform and non uniform bending method, the moment of inertia and Rigidity Modulus for thin wire using Torsion Pendulum
		CO2.Use Poiseuille's method for determining the coefficient of viscosity of the liquid.
		CO3.Evaluate the refractive index of spectral lines for determining the dispersive power of a prism.
		CO4.Determine the type, amount of alkalinity , hardness in a given water sample and evaluate the amount of copper using EDTA method
		CO5.Examine the potentiometric redox titration and Conductometric precipitation titration.
GE6263	COMPUTER PROGRAMMING LABORATORY	CO1.Explain UNIX Operating system and usage of file system.
		CO2.Apply Shell Commands for a given task using filter and pipe commands.
		CO3.Develop and implement the Shell scripts in VI editor.
		CO4.Develop C Program on Unix environment.
		CO5.Apply File handling in C to copy, merge and display the given file.
EE6211	ELECTRIC CIRCUITS LABORATORY	CO1.Ability to analyze and Simulate electric circuits by kirchoff's laws
		CO2.Ability to understand and apply circuit theorems and concepts in engineering applications
		CO3.Ability to analyze and simulate the resonance circuits
		CO4.Ability to analyze and simulate the transient response of circuits.
		CO5.Ability to simulate the three phase circuits for star and delta connection networks.
MA6351	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	CO1.Understand the basic concept of PDE solving partial diff eqn
		CO2.Solve differential Eqn Using Fourier series
		CO3.Analyze the Forier Series Techniques in solving one and two dimensional heat flow problems
		CO4.Understand the concept of Transforms and PDE
		CO5.Analyze the PDE by using Z-Transform
EE6301	DIGITAL LOGIC CIRCUITS	CO1.Understand various number systems and simplify the logical expressions using Boolean functions
		CO2.Design combinational circuits using logic gates and sequential circuits
		CO3.Design various sysnchronous and asynchronous circuits
		CO4.Analyze the asynchronous sequential circuits and PLDs
		CO5.Analyze the digial simulation for developmant of application oriented logic circuits

EE6302	ELECTROMAGNETIC THEORY	CO1.Learn the basic vector algebra for electromagnetic theory
		CO2.Interpret the concept of electrostatic field
		CO3.Develop the concept of magnetic field
		CO4.Analyze Maxwell's equation for EMF
		CO5.Derive electro magnetic wave equation and apply poy nting expression
GE6351	ENVIRONMENTAL SCIENCE AND ENGINEERING	CO1.Define Environment, ecosystem and biodiversity, classify types of ecosystems and outline the impacts to biodiversity.
		CO2.Define pollution, classify its types, analyze the causes and suggest control measures for pollution.
		CO3.Outline various natural resources; explain causes and impacts of destruction of resources.
		CO4.List various social issues related to land, water and energy; summarize the concerning government acts and rules to overcome these problems.
		CO5.Interpret population explosion and variation among nations, show the impacts of over population and illustrate the methods to mitigate the same.
EC6202	ELECTRONICS DEVICES AND CIRCUITS	CO1.Understand and analyze PN junction devices.
		CO2.Identify and analyze the different types of electronic devices.
		CO3.Design and analyze the amplifier circuits.
		CO4.Analyze the single stage and multi stage amplifier.
		CO5.Design and analyze the oscillator circuits.
EE6303	LINEAR INTEGRATED CIRCUITS AND APPLICATIONS	CO1.Acquire knowledge in IC fabrication
		CO2.Analyze the characteristics of Operational amplifier
		CO3. Acquire knowledge in applications of Operational amplifier
		CO4.Analyze the functional blocks and applications of Special Ics
		CO5.Design circuits using various Applications ICs
EC6361	ELECTRONICS LABORATORY	CO1.Find the breakdown voltage of Diode, draw the V-I characteristics of BJT.
		CO2.Draw the equivalent circuit of JFET and develop the saw tooth waveform generation using UJT
		CO3.Design the Common Emitter amplifier and draw the V-I characteristics of photo diode & photo transistor
		CO4.Analyze and design the oscillator circuits.
		CO5.Show the frequency response of filters, design the multivibrators
EE6311	LINEAR AND DIGITAL INTEGRATED CIRCUITS LABORATORY	CO1.Design and implement Boolean Functions.
		CO2.Design and implementation of code conversion
		CO3.Design and implement the 4-bit shift registers
		CO4.Acquire knowledge on Application of Op-Amp and IC 555 timer.
		CO5.Design and implement counters using specific counter IC.
EE6404	MEASUREMENTS AND INSTRUMENTATION	CO1.Describe the basic functional block elements in Different measuring Instruments and the errors in the measurement system
		CO2.Analyze construction and working of electrical and electronics instruments.
		CO3.Design AC and DC bridge circuits to determine the values of resister, inductor and capacitors.
		CO4.Analyze the various types of storage and display devices.

		CO5.Analyze the concepts of various transducers and data acquisition systems.
MA6459	NUMERICAL METHODS	CO1.Understanding the basic concepts and techniques of solving algebraic and transcendental equation
		CO2.Using the numerical techniques of interpolation and error in various interval for real life
		CO3.Apply the numerical techniques of differentiation and integration
		CO4.Apply the knowledge of various techniques and methods to solve 1st and 2nd ODE
		CO5.Analyze the partial and ODE with initial and boundary conditions by Using certain techniques with engineering APP
EE6401	ELECTRICAL MACHINES-I	CO1.Understand the properties of Magnetic materials for the machines
		CO2.Acquire the knowledge about transformer operation and its characteristics
		CO3.Apply the knowledge about fundamental concept of Electro mechanical Energy Conversion in electrical machines.
		CO4.Analyze the performance of DC Generator and derive its parameters.
		CO5.Understand the concept of DC Motor operation and derive its parameters.
CS6456	OBJECT ORIENTED PROGRAMMING	CO1.Ability to develop applications using Object Oriented Programming Concepts
		CO2.To improve optimized coding by using generic programming
		CO3.Ability to implement features of object oriented programming to solve real world problems.
		CO4.Apply the concept of exception handling Mechanism for real time application
		CO5.Ability to implement features of object oriented programming to solve real world problems.
EE6402	TRANSMISSION AND DISTRIBUTION	CO1.Identify the basic elements of the electric power system, generation, transmission, distribution and describe the role played by each element
		CO2.Compute the losses, efficiency and parameters of the Transmission line.
		CO3.Analyze the Performance of Transmission Lines.
		CO4.Solve the voltage distribution in insulator strings, cables and methods to improve the same
		CO5.Design overhead lines both Mechanical and electrical aspects using Sag calculation.
EE6403	DISCRETE TIME SYSTEMS AND SIGNAL PROCESSING	CO1.Classify signals and systems & their mathematical representation
		CO2.Analyse the discrete time systems
		CO3.Compute various transformation techniques
		CO4.Design filters for digital implementation
		CO5. Describe programmable digital signal processor & quantization effects
CS6461	OBJECT ORIENTED PROGRAMMING LABORATORY	CO1.Design C++ programs using functions, classes with objects, member functions and constructors.
		CO2.Develop operator and function overloading and run time polymorphism using C++.
		CO3.Develop file handling techniques in C++ for sequential and random access also use Java code for strings.
		CO4.Construct packages and interfaces in Java.
		CO5.Create threads in Java and handle predefined and user defined exceptions.
EE6411	ELECTRICAL MACHINES LABORATORY - I	CO1.Investigate the voltage drop due to armature reaction effect in DC shunt and DC compound generators and Design Ampere turns for Inter poles and compensating winding. Examine critical resistance and critical speed.
		CO2.Analyze load characteristics DC shunt, series and compound motor. Examine its maximum output and maximum efficiency
		CO3.Investigate the constant losses of the DC shunt motor predict the efficiency in different methods at different load condition

		CO4.Analyze load characteristics of single and three phase transformer. Examine the different losses and efficiency
		CO5.Investigate the the equivalent circuit parameters of single phase transformer to predetermine its voltage regulation and efficiency.
EE6501	POWER SYSTEM ANALYSIS	CO1.Model the power system components and apply them to various power system studies
		CO2.Develop the power flow equation for power system problems and determine the line flows using various algorithms.
		CO3.Illustrate and analyse the different types of faults under balanced condition.
		CO4.Illustrate and analyse the different types of faults under unbalanced condition.
		CO5.Explain the concept of power system stability and analyse the stability of single machine infinite bus system.
EE6503	POWER ELECTRONICS	CO1.Acquiring knowledge on various power semiconducting devices along with their switching characteristics
		CO2.Analyzing the various phase controlled converters.
		CO3.Analyzing and evaluating the various DC-DC converters
		CO4.Analyze inverters and using them in relevant applications
		CO5.Analyzing the AC-AC converters and choosing them for real-time applications.
EE6502	MICROPROCESSORS AND MICROCONTROLLERS	CO1.Basic understanding of architecture and its functionalities
		CO2.Understand and apply computing platform & software programming
		CO3.Understand 8051 microcontroller architecture and its functionalities
		CO4.Design and implement peripheral interface using 8085 & 8051
		CO5.An indepth knowledge of appliting the concept in realtime applications
EE6504	ELECTRICAL MACHINES – II	CO1.Apply the Knowledge of Engineering fundamentals to the solutions of induced emf, voltage Regulation, performance characteristics and analyzing the operation of synchronous generator
		CO2.Apply the Knowledge of Engineering fundamentals to find torque developed in synchronous motor developed, performance characteristics and analyzing the operation of synchronous motor
		CO3.Apply the Knowledge of Engineering fundamentals to find torque developed in three phase induction motor performance characteristics and analyzing the operation of three phase induction motor
		CO4.Analyze the operations of starter and speed control of three phase induction motor
		CO5.Apply the Knowledge of Engineering fundamentals to find torque developed in special electrical machines.
ME6701	POWER PLANT ENGINEERING	CO1.Develop the expressions for computation of transmission line parameters
		CO2..Analyze the performance of transmission lines.
		CO3.Design overhead lines in mechanical aspects and analyze the voltage distribution in insulator strings.
		CO4.Explain the construction of cables and analyze the parameters in cables.
		CO5.Describe the importance of distribution systems and substations.
IC6501	CONTROL SYSTEMS	CO1.Modeling of all types of physical systems and transfer function.
		CO2.Analyze first and second order systems and difference between time domain and frequency domain.
		CO3.Analyze the Stability theoretically and by using MATLAB.
		CO4.Analyze and Design the compensators to obtain the system stability.
		CO5.Design the state space model for linear time and invariant systems.

Course Code	Course Name	Course Outcomes
EE6511	CONTROL AND INSTRUMENTATION LABORATORY	CO1.Determine the characteristics of P, PI and PID controllers experimentally and analyze the stability of the control system by (i) Bode plot (ii) Root Locus Plot and (iii) Nyquist plot using MATLAB.
		CO2.Compute the transfer function of a Field controlled DC motor experimentally and Design the Lag, Lead and Lag-Lead Compensators for the given specifications and hook up it using RC networks.
		CO3.Draw the transient response of Position Control system experimentally, Determine the Characteristics of Synchro-Transmitter- Receiver and Use the MATLAB for the Simulation of Control Systems.
		CO4.Calculate the unknown Capacitance, Inductance and Resistance using AC and DC Bridges experimentally and Analyze the Dynamics of Sensors/Transducers (a) Temperature (b) Pressure (c) Displacement (d) Optical (e) Strain and (f) Flow.
		CO5.Measure the Power and Energy experimentally; Analyze the Signal Conditioning units (a) Instrumentation Amplifier (b) ADC and DACs and Use the MATLAB for Process Simulation
GE6674	COMMUNICATION AND SOFT SKILLS- LABORATORY BASED	CO1.Apply appropriate communication skills across settings, purposes and audiences.
		CO2.Demonstrate knowledge of communication theory and applications.
		CO3.Practice critical thinking to develop innovative and well-founded perspectives related to the students emphasis. Build and maintain healthy and effective relationships.
		CO4.Use technology to communicate effectively in various settings and contexts.
		CO5.Demonstrate appropriate and professional ethical behavior.
EE6512	ELECTRICAL MACHINES LABORATORY – II	CO1.Draw the constructional details and explain the performance of salient and non –salient type synchronous generators
		CO2.Draw and explain the Principle of operation and performance of synchronous motor
		CO3.Draw and describe the construction, principle of operation and performance of induction machines.
		CO4.Describe the starting and speed control of three-phase induction motors.
		CO5.Explain the construction, principle of operation and performance of single phaseinduction motors and special machine
EE6604	DESIGN OF ELECTRICAL MACHINES	CO1.Apply the Knowledge of Engineering fundamentals to the solutions of magnetic circuits
		CO2.Apply the Knowledge of Engineering fundamentals to the design solutions of transformers
		CO3.Apply the Knowledge of Engineering fundamentals to the design solutions of DC machines
		CO4.Apply the Knowledge of Engineering fundamentals to the design solutions of induction motors
		CO5.Apply the Knowledge of Engineering fundamentals to the solutions of magnetic circuits
EE6601	SOLID STATE DRIVES	CO1. Select an electric drive for a particular application based on their performance characteristics
		CO2. Analyse the steady-state and dynamic operation of converter fed dc drives and chopper fed dc drives
		CO3. Distinguish various speed control methods of induction motor based on their loads.
		CO4. Distinguish various speed control methods of synchronous motor based on their loads.
		CO5. Design the closed loop speed control of DC drives for different applications
EC6651	COMMUNICATION ENGINEERING	CO1.Explain the operation of Amplitude Modulation , draw the frequency spectrum and vector representation.
		CO2.Compare the different methods of QPSK, BFSK and GMSK
		CO3.Analyze how information is transmitted to receiver using the Huffman Coding
		CO4.Discuss about the various types of multiple access techniques
		CO5.Distinguish between INTELSAT and INSAT
		CO1.Describe the bus communication in processors with Input/ Output interfacing.
		CO2.Identify the various embedded development strategies.

EE6602	EMBEDDED SYSTEMS	CO3.Acquire the knowledge on various processor scheduling algorithms and understand basics of Real time operating system.
		CO4.Model real-time applications using embedded-system concepts.
		CO5.Describe the bus communication in processors with Input/ Output interfacing.
EE6002	POWER SYSTEM TRANSIENTS	CO1.Explain the concept of transients and Compute the solution of transient current equation for RL and RLC system.
		CO2.Illustrate the importance of switching transients, Explain the concept of resistance switching, load switching and capacitance switching
		CO3.Explain the concept of lightning mechanism, Describe the interaction between lightning and power system
		CO4.Apply the concept of reflection and refraction, Draw the Bewley Lattice diagram for different systems.
		CO5.Analyze the concept of short line (or) Kilometric fault and justify the EMTP for transient computation.
EE6603	POWER SYSTEM OPERATION AND CONTROL	CO1.Understand the day-to-day operation of electric power system and analyze the control actions to be implemented on the system to meet the minute-to-minute variation of system demand.
		CO2.Describe the modelling of power frequency dynamics and design the power frequency controller
		CO3.Explain the modelling of reactive power -voltage interaction and the control actions.
		CO4.Solve economic dispatch problems and unit commitment problems in power systems.
		CO5.Explain the need of computer controls for energy management system using SCADA
EE6611	POWER ELECTRONICS AND DRIVES LABORATORY	C01.Practice and understand converter and inverter circuits and apply software for engineering problems.
		CO2.Experiment about switching characteristics various switches.
		CO3.Analyze about AC to DC converter circuits.
		C04.Simulate DC to DC circuits.
		CO5.Simulate AC to AC converters using MATLAB
EE6612	MICROPROCESSORS AND MICROCONTROLLERS LABORATORY	CO1.Apply computing platform and software for engineering problems.
		CO2.Apply the knowledge to programming logics for code conversion.
		CO3.and apply knowledge on A/D and D/A.
		CO4.Understand basics of serial communication.
		CO5.Understand basics of software simulators.
EE6613	PRESENTATION SKILLS AND TECHNICAL SEMINAR.	C01:Present seminar in the field of electrical and electronics engineering subjects studied.
		CO2:Solve objective type questions in the field of electrical and electronics engineering.
		CO3;Communicate effectively, the subjects learned in the form of seminar presentation.
		CO4:Communicate effectively, the modern trends in the field of electrical and electronics engineering.
		CO5.Answer effectively during technical interviews.
EE6701	HIGH VOLTAGE ENGINEERING	C01.Analyze the various types of overvoltages in power system and protection methods.
		CO2.Analyze the nature of breakdown mechanism in solid,liquid and gas.
		C03.Explain the principle of generation of high voltage DC,AC and impulse voltages
		CO4.Explain the principle of measurement of high voltages DC,AC and impulse voltages
		CO5:Select appropriate hardware for testing of power apparatus and insulation coordination.

MG6851	PRINCIPLES OF MANAGEMENT	CO1;Describe the basic of management and its types, skills, management roles, types of business organizations and current trends in business.
		CO2.Explain the nature and purpose of planning , types, objective of planning and decision process
		CO3.Compare the different organization structures, Authorities and responsibilities, Human resource management and training and development.
		CO4.Estimate the individual and group behavior, motivation, job satisfaction, types and theories of leadership, communication and IT.
		CO5;Apply the knowledge using the various System and process of controlling, budgetary and non-budgetary control techniques, use of computers and IT in Management control, reporting
EE6702	PROTECTION AND SWITCH GEAR	CO1.Understand the need for protection in power system
		CO2. Understand the working operation of relay and their protection in power system.
		C03.Analyse the different types of faults and their protection in electrical equipment like transformer ,motors, generators, busbar, feeders.
		CO4. Understand the working operation of static and numerical relay and their protection in power system.
		CO5.Select the particular type of circuit breakers for protection based upon the power system to be protected.
EE6103	SPECIAL ELECTRICAL MACHINES	CO1.Analyze the performance and operation of stepper motor
		CO2.Analyze the performance of Switched reluctance motor
		CO3;Analyze the performance of Permanent magnet Brushless DC Motor
		CO4:Analyze the performance of permanent magnet Synchronous Motor
		CO5:Analyze the performance of synchronous Reluctance motor.
EE6005	POWER QUALITY	CO1;Discuss the various types of power quality problem
		CO2;Describe and analyze the source, types and mitigation of sag
		CO3:Describe and analyze the source, types and mitigation of overvoltage
		CO4. the effects of harmonics on power system and method of controlling harmonics.
		CO5.Explain the operation of various power quality monitoring devices
EE6007	MICRO ELECTRO MECHANICAL SYSTEM	CO1.Analyze the process of micro fabrication.
		CO2.Design & fabricate the micro devices like sensors & actuators
		CO3.Analyse the mechanical properties of materials used for sensors & actuators
		CO4.Assemble & fabricate 3d mems devices
		CO5.Analyze the different types of polymers used for fabrication
EE6711	POWER SYSTEM SIMULATION LABORATORY	CO1.Determine the bus impedance and admittance matrices for analysing the power system network.
		CO2.Apply numerical methods for solving load flow problems using iterative algorithms.
		CO3.Analyze various faults occurring in power system and calculate the fault current.
		CO4.Analyze small signal stability of Single Machine Infinite Bus (SMIB) system and electromagnetic transients in power system.
		C05.Solve the economic dispatch problems and analyze the load frequency dynamics for single area and two area system.
EE6712	COMPREHENSION	C01.Describe the basic concepts of electrical and electronics subjects.
		CO2.Solve objective type questions in the field of electrical and electronics engineering
		CO3.Review, prepare and present technological developments

		CO4.Analyze the modern trends in the field of electrical and electronics engineering.
		CO5.Answer effectively during technical interviews.
EE6801	ELECTRIC ENERGY GENERATION, UTILISATION & CONSERVATION	CO1.Evaluate the illumination level and wattage consumption by applying laws of illumination.
		CO2.Analyze the various types of air conditioning system and the energy efficient motors used in the air conditioning and Refrigeration unit.
		CO3.Analyse the different Heating methods and Welding methods used in the industry and Evaluate the energy consumption of electric furnaces.
		CO4.Apply the knowledge of mathematics to evaluate the specific energy consumption of different traction services and analyse the different traction motor control.
		CO5.Analyse the different Domestic utilization of electric energy and the power quality aspects.
EE6009	POWER ELECTRONICS FOR RENEWABLE ENERGY SYSTEMS	CO1.Discuss and analyze the various types of renewable energy sources
		CO2.Analyze the performance of IG, PMSG, SCIG and DFIG
		CO3.Design different power converters namely AC to DC, DC to DC and AC to AC converters for renewable energy systems.
		CO4.Analyze various operating modes of wind electrical generators
		C05.Develop maximum power point tracking algorithms.
GE6075	PROFESSIONAL ETHICS IN ENGINEERING	CO1.To create a basic perception on various moral, human values and ethics.
		CO2.To understand the basic perception of profession, professional ethics, moral issues and the role of ethical theories in engineering field
		CO3.To create an insight of social responsibilities and the code of ethics to be followed by an engineer.
		CO4.To understand the professional rights and responsibilities of an engineer for safety and risk analysis.
		CO5.To acquire knowledge about roles of engineers in various global issues and able to apply ethical principles to resolve situations that arise in their professional lives
EE6811	PROJECT WORK	CO1.Apply the fundamentals of mathematics, science and engineering knowledge to identify , formulate , design and investigate complex engineering problems of electrical and electronics engineering and allied applications .
		CO2.Apply appropriate techniques and modern engineering hardware and software tools in electrical and electronics engineering and allied applications.
		CO3.Apply reasoning informed by the contextual knowledge to assess societal , health, safety, legal and cultural issues with societal and environmental context , applying ethical principles in the field of electrical and electronics engineering and allied applications.
		C04.Function effectively as an individual and as a member or leader in diverse teams in multidisciplinary settings and make effective presentation, and communicate effectively.
		CO5.Demonstrate the understanding of the engineering and management principles in multidisciplinary environments to engage in lifelong learning in the broadest context of technological change.

HoD/EEE

Head of the Department
Department of EEE
Prathyusha Engineering College,
Chennai - 602 025.

COURSE CODE	COURSE NAME	COURSE OUTCOMES
HS 8151	TECHNICAL ENGLISH – I	CO1.Manipulate effectively in informal conversations; introduce themselves and their friends and express opinions in English in day-to-day contexts.
		CO2.Dicriminate to read relevant concepts and learn to write freely.
		CO3.Anticipate conversations and short talks delivered in English in an effective way.
		CO4.Compile short essays and paragraphs of a general kind and personal letters and e mails in English in the domestic environment.
		CO5.Categorize the technical articles through reading standard journals and magazines.
PH8151	ENGINEERING PHYSICS – I	CO1.Gain the knowledge on the basis of Properties of matters and Materials
		CO2. Acquire the knowledge on Waves concept and optical devices and its applications
		CO3.Attain knowledge on material, Heat exchangers series and parallel
		CO4.Enhance the knowledge on advanced physics-Quantum physics
		CO5.Apply the knowledge on the basics of crystal structures and its growth in industrial sector.
MA8151	MATHEMATICS I	CO1.Apply both the limit definition and rules of differentiation to different functions. solve maxima and minima of functions
		CO2.Analyze and solve the partial differentiation for functions of several variables by various methods
		CO3.Evaluate integrals by using various techniques of integration such as substitution, partial fraction and by parts
		CO4.Apply integration to compute mutliple integrals, Area, Volume in Polar in addition to change of order
		CO5.Apply various techniques in solving differential equations.
CY8151	ENGINEERING CHEMISTRY	CO1.Design water treatment techniques by analyzing the requirement of boiler feed water and its problems
		CO2.Analyse the various Industrial applications of Surface Chemistry and Catalysis by understanding the basic concepts
		CO3.Develop the applications to single and two component systems by understanding the basic concepts of phase rule and to appreciate the significance of alloys.
		CO4.Analyzing the manufacture of various types of fuels and to interpret its calorific value during combustion
		CO5.Understand the basics of crystal structures and its growth
GE 8152	ENGINEERING GRAPHICS	CO1.Sketch the conic sections, special curves, and draw orthographic views from pictorial views and models.
		CO2.Apply the principles of orthographic projections of points in all quadrants, lines and planes in first quadrant.
		CO3.Sketch the projections of simple solids like prisms, pyramids, cylinder and cone and obtain the traces of plane figures
		CO4.Practice the sectional views of solids like cube, prisms, pyramids, cylinders & cones and extend its lateral surfaces
		CO5.Sketch the perspective projection of simple solids, truncated prisms, pyramids, cone and cylinders and sketch the isometric projection of simple machine parts.

GE 8151	PROBLEM SOLVING AND PYTHON PROGRAMMING	CO1.Adapt, analyze and develop standard algorithm to solve problem
		CO2.Identify and use the appropriate data types for variables being critically aware of memory and complexity issues.
		CO3.Design and implement control flow and function concepts in python program for solving problems
		CO4.Implement python data structure list, tuple and dictionary for representing complex data problems
		CO5.Develop and implement python file modules and functions which react robustly to exceptional input for solving real world problems
GE 8161	PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY	CO1.Develop,test, and debug simple Python programs.
		CO2.Implement Python programs with conditionals and loops.
		CO3.Develop Python programs step-wise by defining functions and calling them.
		CO4.Use Python lists, tuples, dictionaries for representing compound data.
		CO5.Read and write data from/to files in Python.
BS 8161	PHYSICS AND CHEMISTRY LABORATORY	CO1.To gain the practical knowledge on various kinds of Modulus using non uniform and torsional pendulum experiment method
		CO2.To understand the practical optical knowledge on laser & fiber optics and light experiments
		CO3.Analyse water quality parameters through volumetric analysis
		CO4.Estimate the strength and amount of acids using various instruments
		CO5.Demonstrate to calculate the amount of metallic ions by Spectrophotometer and Flame photometer.
HS 8251	TECHNICAL ENGLISH	CO1.speak clearly, confidently, comprehensibly, and communicate with one or many people.
		CO2.Write cohesively and coherently and flawlessly avoiding grammatical errors, using a wide vocabulary range, organizing their ideas logically on a topic.
		CO3.Read different genres of texts adopting various reading strategies.
		CO4.l isten/view and comprehend different spoken discourses/excerpts in different accents
		CO5.Recognize, understand, and analyze the context within which language, information, and knowledge are produced, managed, organized, and disseminated.
MA 8251	ENGINEERING MATHEMATICS - II	CO1.Evaluate Eigen valus and vectors, Diagonalization of matrices, positive definite matrices and similar matrices
		CO2.Analyse and to solve the problem of vector differentiation and vector integration
		CO3.Analyse and to solve the problem of analytic function, conformal mapping and bilinear transformations
		CO4.Evaluate the real integrals by applying the concept of complex integration
		CO5.Analyse and apply the knowledge of Laplace Transform in solving ODE
PH 8253	PHYSICS FOR ELECTRONICS ENGINEERING	CO1.Apply the knowledge on the basis of conducting Materials
		CO2. Acquire the knowledge on Semiconductor concept, devices and its applications
		CO3.Apply knowledge on Magnetic and Dielectric material
		CO4.Enhance the knowledge on advanced optical Devices and its applications
		CO5.Apply the knowledge of Nano materials and its Applications in industries.

GE 8251	ENVIRONMENTAL SCIENCE AND ENGINEERING	CO1.Analyze the concept of an ecosystem and biodiversity to protect the environment
		CO2.Design the environmental friendly process in engineering to protect environment from various pollutions
		CO3.Evaluate the techniques which require optimum use of natural resources in future
		CO4.Demonstrate the need for sustainable development and to create awareness of important act and laws in respect to environment.
		CO5.Estimate the population and economic growth, energy requirement and demand.
BE 8252	BASIC CIVIL AND MECHANICAL ENGINEERING	CO1.Understand the difference between civil and mechanical engineering.
		CO2.Identify the correct engineering materials.
		CO3.Analysis the building component and structure.
		CO4.Demonstrate working principles of petrol and diesel engines, pumps and understand the working principle of boilers and power plants.
		CO5.Elaborate the components of refrigeration and Air conditioning cycle.
EE 8251	CIRCUIT THEORY	CO1.Understand the Concepts of Electric Circuits and to analyze the electric circuits.
		CO2.Apply the knowledge on electric circuits on solving circuit equations using network theorems
		CO3.Ability to evaluate the transient response of circuits.
		CO4.Ability to explain the concepts of phasor diagrams and analyse the three phase circuits
		CO5.Analyze resonant and coupled circuits.
EE 8261	ELECTRIC CIRCUITS LABORATORY	CO1.Ability to analyze and Simulate electric circuits by kirchoff's laws
		CO2.Ability to understand and apply circuit theorems and concepts in engineering applications
		CO3.Ability to analyze the resonance circuits
		CO4.Ability to analyze and simulate the transient response of circuits.
		CO5.Ability to simulate the three phase circuits for star and delta connection networks.
GE 8261	ENGINEERING PRACTICES LABORATORY	CO1.Fabricate carpentry components and pipe connections including plumbing works
		CO2.Calculate the different Electrical quantities, measure the energy consumption using single phase energy meter.
		CO3.Demonstrate wiring for a simple residential house, identify the ratings of various appliances like Fluorescent tube, incandescent lamp, etc.
		CO4.Explain the basic electronic components , gates and soldering practices
		CO5.Develop soldering in a PCB, measure ripple factor of Half Wave Rectifier and Full Wave Rectifier..
MA 8353	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	CO1.Understand the basic concept of PDE solving partial diff eqn
		CO2.Solve differential Eqn Using Fourier series
		CO3.Analyze the Forier Series Techniques in solving one and two dimensional heat flow problems
		CO4.Understand the concept of Transforms and PDE
		CO5.Analyze the PDE by using Z-Transform

EE8391	ELECTROMAGN ETIC THEORY	CO1.Explain different coordinate systems and apply gauss law
		CO2.Interpret the concept of electrostatic fields and apply boundary condition
		CO3.Develop the concept of magnetic field and apply boundary condition
		CO4.Analyze maxwells equation for electro magnetic field
		CO5.Derive electromagnetic wave equation and apply poynting expression
EC 8353	ELECTRONIC DEVICES AND CIRCUITS	CO1.Understand and analyze PN junction devices.
		CO2.Identify and analyze the different types of electronic devices.
		CO3.Design and analyze the amplifier circuits.
		CO4.Analyze the single stage and multi stage amplifier.
		CO5.Design and analyze the oscillator circuits.
EE 8301	ELECTRICAL MACHINES - I	CO1.Understand the properties of Magnetic materials for the machines
		CO2.Acquire the knowledge about transformer operation and its characteristics
		CO3.Gain the knowledge about fundamental concept of Electro mechanical Energy Conversion
		CO4.Analyze the performance of DC Generator
		CO5.Understand the concept of DC Motor operation and solve its parameters.
ME 8762	POWER PLANT ENGINEERING	CO1.Identify the various components of modern coal power plant and analyse the safety measures of environmental factors in thermal power plant.
		CO2.Apply the knowledge of various gas power cycles to analyse the construction and working of various liquid and gas Power Plants.
		CO3.Review the layout and working of the components of nuclear power plants and analyze the safety measures of the environment for the healthy society.
		CO4.Identify the various renewable energy resources of power generation and gain the knowledge for sustainable development.
		CO5.Formulate the cost of electrical energy based on Power tariff, analyse the Economics and discuss the safety aspects of power plant operation.
EE 8351	DIGITAL LOGIC CIRCUITS	CO1.Understand various number systems and simplify the logical expression using boolean expression
		CO2.Design various combinational digital circuits using logic gates
		CO3.Design and analyze various synchronous sequential circuits
		CO4.Understand and analyze the asynchronous sequential circuits and programmable logic devices
		CO5.Understand and analyze the digital simulation for the development of application oriented logic circuits
EC 8311	ELECTRONICS LABORATORY	CO1.Find the breakdown voltage of Diode, draw the V-I characteristics of BJT.
		CO2.Draw the equivalent circuit of JFET and develop the saw tooth waveform generation using UJT
		CO3.Design the Common Emitter amplifier and draw the V-I characteristics of photo diode & photo transistor
		CO4.Analyze and design the oscillator circuits.
		CO5.Show the frequency response of filters, design the multivibrators

Course Code	Course Name	Course Outcomes
EE 8311	ELECTRICAL MACHINES LABORATORY - I	CO1.Investigate the voltage drop due to armature reaction effect in DC shunt and DC compound generators and Design Ampere turns for Inter poles and compensating winding. Examine critical resistance and critical speed.
		CO2.Analyze load characteristics DC shunt, series and compound motor. Examine its maximum output and maximum efficiency
		CO3.Investigate the constant losses of the DC shunt motor predict the efficiency in different methods at different load condition
		CO4.Analyze load characteristics of single and three phase transformer. Examine the different losses and efficiency
		CO5.Investigate the the equivalent circuit parameters of single phase transformer to predetermine its voltage regulation and efficiency.
MA 8411	NUMERICAL METHODS	CO1.Understanding the basic concepts and techniques of solving algebraic and transcendental equation
		CO2.Using the numerical techniques of interpolation and error in various interval for real life
		CO3.Apply the numerical techniques of differentiation and integration
		CO4.Understand the knowledge of various techniques and methods solving 1st and 2nd ODE
		CO5.Analyse the partial and ODE with initial and boundary conditions by Using certain techniques with engineering APP
EE 8401	ELECTRICAL MACHINES – II	CO1.Apply the Knowledge of Engineering fundamentals to the solutions of induced emf, voltage Regulation, performance characteristics and analyzing the operation of synchronous generator
		CO2.Apply the Knowledge of Engineering fundamentals to find torque developed in synchronous motor developed, performance characteristics and analyzing the operation of synchronous motor
		CO3.Apply the Knowledge of Engineering fundamentals to find torque developed in three phase induction motor performance characteristics and analyzing the operation of three phase induction motor
		CO4.Analyze the operations of starter and speed control of three phase induction motor
		CO5.Apply the Knowledge of Engineering fundamentals to find torque developed in special electrical machines developed, performance characteristics and analyzing the operation of synchronous motor.
EE 8402	TRANSMISSION AND DISTRIBUTION	CO1.Develop the expressions for computation of transmission line parameters
		CO2.Analyze the performance of transmission lines.
		CO3.Design overhead lines in mechanical aspects and analyze the voltage distribution in insulator strings.
		CO4.Explain the construction of cables and analyze the parameters in cables.
		CO5.Describe the importance of distribution systems and substations.
EE 8403	MEASUREMENTS AND INSTRUMENTATION	CO1.Analyze the basic functional block elements in Different measuring Instruments and the errors in the measurement system
		CO2.Analyze construction and working of electrical and electronics instruments.
		CO3.Design AC and DC bridge circuits to determine the values of resister, inductor and capacitors.
		CO4.Analyzing various types of storage and display devices.
		CO5.Analyze the concepts of various transducers and data acquisition systems.
EE 8451	LINEAR INTEGRATED CIRCUITS AND APPLICATIONS	CO1.Acquire knowledge in IC fabrication
		CO2.Analyze the characteristics of Operational amplifier
		CO3.To understand and acquire knowledge in applications of Operational amplifier
		CO4.Analyze the functional blocks and applications of Special Ics
		CO5.To design circuits using various Applications ICs

Course Code	Course Name	Course Outcomes
IC 8451	CONTROL SYSTEMS	CO1. Modeling of all types of physical systems and transfer function.
		CO2. Analyze first and second order systems and difference between time domain and frequency domain.
		CO3. Analyse the Stability theoretically and by using MATLAB.
		CO4. Analyse and Design the compensators to obtain the system stability.
		CO5. Design the state space model for linear time and invariant systems.
EE 8461	LINEAR AND DIGITAL INTEGRATED CIRCUITS LABORATORY	CO1. Design and implement Boolean Functions.
		CO2. Design and implementation of code conversion
		CO3. Design and implement the 4-bit shift registers
		CO4. Acquire knowledge on Application of Op-Amp and IC 555 timer.
		CO5. Design and implement counters using specific counter IC.
EE 8411	ELECTRICAL MACHINES LABORATORY - II	CO1. Draw the constructional details and explain the performance of salient and non –salient type synchronous generators
		CO2. Draw and explain the Principle of operation and performance of synchronous motor
		CO3. Draw and describe the construction, principle of operation and performance of induction machines.
		CO4. Describe the starting and speed control of three-phase induction motors.
		CO5. Explain the construction, principle of operation and performance of single phase induction motors and special machine
EE 8501	POWER SYSTEM ANALYSIS	CO1. Apply engineering knowledge to evaluate p.u unit value and formulate the bus admittance matrix for given power system network
		CO2. Analyze the load flow technique using NR and GS methods for power system networks and interpret the results.
		CO3. Analyze the power system network under symmetrical fault condition using thevenin's theorem and Z bus Matrix method.
		CO4. Analyze the power system network under unsymmetrical fault condition using symmetrical components.
		CO5. Analyze the transient stability of power system using Equal Area Criterion and to apply modified eulers methods to solve Swing equation.
EE 8551	MICROPROCESSORS AND MICROCONTROLLERS	CO1. Basic understanding of architecture and its functionalities
		CO2. Understand and apply computing platform & software programming
		CO3. Understand 8051 microcontroller architecture and its functionalities
		CO4. Design and implement peripheral interface using 8085 & 8051
		CO5. An in depth knowledge of applying the concept in real time applications
EE 8552	POWER ELECTRONICS	CO1. Acquiring knowledge on various power semiconducting devices along with their switching characteristics
		CO2. Analyzing the various phase controlled converters.
		CO3. Analyzing and evaluating the various DC-DC converters
		CO4. Analyze inverters and using them in relevant applications
		CO5. Analyzing the AC-AC converters and choosing them for real-time applications.

Course Code	Course Name	Course Outcomes
EE 8002	DESIGN OF ELECTRICAL MACHINES	CO1.Apply the Knowledge of Engineering fundamentals to the solutions of magnetic circuits
		CO2.Apply the Knowledge of Engineering fundamentals to the design solutions of transformers
		CO3.Apply the Knowledge of Engineering fundamentals to the design solutions of DC machines
		CO4.Apply the Knowledge of Engineering fundamentals to the design solutions of induction motors
		CO5.Apply the Knowledge of Engineering fundamentals to the design solutions of synchronous machines
EE 8601	SOLID STATE DRIVES	CO1.Select an electric drive for a particular application based on their performance characteristics
		CO2.Analyse the steady-state and dynamic operation of converter fed dc drives and chopper fed dc drives
		CO3.Distinguish various speed control methods of induction motor based on their loads.
		CO4.Distinguish various speed control methods of synchronous motor based on their loads.
		CO5.Design the closed loop speed control of DC drives for different applications
EE 8602	PROTECTION AND SWITCHGEAR	CO1.Understand the need for protection in power system
		CO2.Understand the working operation of relay and their protection in power system.
		CO3.Analyse the different types of faults and their protection in electrical equipment like transformer, motors, generators, busbar, feeders.
		CO4.Understand the working operation of static and numerical relay and their protection in power system.
		CO5.Select the particular type of circuit breakers for protection based upon the power system to be protected.
EE 8691	EMBEDDED SYSTEMS	CO1.Outline the Basic building blocks of an embedded system with its peripherals.
		CO2.Describe the bus communication in processors with Input/ Output interfacing.
		CO3.Identify the various embedded development strategies.
		CO4.Acquire the knowledge on various processor scheduling algorithms and understand basics of Real time operating system.
		CO5.Model real-time applications using embedded-system concepts.
EE 8005	SPECIAL ELECTRICAL MACHINES	CO1.Analyze the performance and operation of stepper motor
		CO2.Analyze the performance of Switched reluctance motor
		CO3.Analyze the performance of Permanent magnet Brushless DC Motor
		CO4.Analyze the performance of permanent magnet Synchronous Motor
		CO5.Analyze the performance of synchronous Reluctance motor.
EE 8661	POWER ELECTRONICS AND DRIVES LABORATORY	CO1.Practice and understand converter and inverter circuits and apply software for engineering problems.
		CO2.Analyze the characteristics of MOSFET,IGBT,GTO and IGCT.
		CO3.Analyse about AC to DC converter circuits.
		CO4.Analyze the Simulation of output waveform PE circuits.
		CO5.Analyze the output waveforms of single phase and three phase IGBT based PWM inverter, AC Voltage controller and the characteristic of PMBLDC motor.

Code	Course	Course Outcomes
EC8553	DISCRETE TIME SYSTEMS AND SIGNAL PROCESSING	CO1.Classify signals and systems & their mathematical representation
		CO2.Analyse the discrete time systems
		CO3.Compute various transformation techniques
		CO4.Design filters for digital implementation
		CO5. Describe programmable digital signal processor & quantization effects
OAN 551	SENSORS AND TRANSDUCERS	CO1.Analyze various calibration techniques
		CO2.Applying various sensors in automotive applications
		CO3.Applying various sensors in Mechatronics applications
		CO4.Understanding the basic principles of smart sensors
		CO5.Implementing DAQ system with different sensors for real time applications
CS 8392	OBJECT ORIENTED PROGRAMMING	CO1.Ability to develop applications using Object Oriented Programming Concepts
		CO2.To improve optimized coding by using generic programming
		CO3.Ability to implement features of object oriented programming to solve real world problems.
		CO4.Apply the concept of exception handling Mechanism for real time application
		CO5.Ability to implement features of object oriented programming to solve real world problems.
CS 8383	OBJECT ORIENTED PROGRAMMING LABORATORY	CO1.Design C++ programs using functions, classes with objects, member functions and constructors.
		CO2.Develop operator and function overloading and run time polymorphism using C++.
		CO3.Develop file handling techniques in C++ for sequential and random access also use Java code for strings.
		CO4.Construct packages and interfaces in Java.
		CO5.Create threads in Java and handle predefined and user defined exceptions.
EE 8511	CONTROL AND INSTRUMENTATION LABORATORY	CO1.Determine the characteristics of P, PI and PID controllers experimentally and analyze the stability of the control system by (i) Bode plot (ii) Root Locus Plot and (iii) Nyquist plot using MATLAB.
		CO2.Compute the transfer function of a Field controlled DC motor experimentally and Design the Lag, Lead and Lag-Lead Compensators for the given specifications and hook up it using RC networks.
		CO3.Draw the transient response of Position Control system experimentally, Determine the Characteristics of Synchro-Transmitter- Receiver and Use the MATLAB for the Simulation of Control Systems.
		CO4.Calculate the unknown Capacitance, Inductance and Resistance using AC and DC Bridges experimentally and Analyze the Dynamics of Sensors/Transducers (a) Temperature (b) Pressure (c) Displacement (d) Optical (e) Strain
		CO5.Measure the Power and Energy experimentally; Analyze the Signal Conditioning units (a) Instrumentation Amplifier (b) ADC and DACs and Use the MATLAB for Process Simulation
HS 8581	PROFESSIONAL COMMUNICATION	CO1.Apply appropriate communication skills across settings, purposes and audiences.
		CO2.Demonstrate knowledge of communication theory and applications.
		CO3.Practice critical thinking to develop innovative and well-founded perspectives related to the students emphasis.
		CO4.Use technology to communicate effectively in various settings and contexts.
		CO5. Practice the ethical and professional behaviour

Code	Course	Course Outcomes
EE 8681	MICROPROCESSORS AND MICROCONTROLLERS LABORATORY	CO1.Design a program for arithmetic operation, Ascending/ Descending order, finding Maximum/Minimum numbers, rotate instruction and code conversions and execute using 8085 processor.
		CO2.Identify and convert Analog to Digital , Digital to Analog numbers and implement the traffic light controller with 8085.
		CO3.Design a code to display the given words using keyboard display controller for serial communication and programming practices with simulator/Emulator /open source
		CO4.Analyze a program using read key to interface with display units and demonstrate conditional jumps ,loops and calling subroutines with 8051 Microcontroller.
		CO5.Create program using I/O port ,8051 timer , A/D & D/A interface with DC & AC motors and develop a program for hardware application using embedded processors
EE 8611	MINIPROJECT	CO1.Apply the fundamentals of mathematics, science and engineering knowledge to identify , formulate , design and investigate complex engineering problems of electrical and electronics engineering and allied applications .
		CO2.Apply appropriate techniques and modern engineering hardware and software tools in electrical and electronics engineering and allied applications.
		CO3.Apply reasoning informed by the contextual knowledge to assess societal , health, safety, legal and cultural issues with societal and environmental context, applying ethical principles in the field of electrical and electronics
		CO4.Function effectively as an individual and as a member or leader in diverse teams in multidisciplinary settings and make effective presentation, and communicate effectively.
		CO5.Demonstrate the understanding of the engineering and management principles in multidisciplinary environments to engage in lifelong learning in the broadest context of technological change.
EE 8701	HIGH VOLTAGE ENGINEERING	CO1.Analyze the various types of overvoltages in power system and protection methods.
		CO2.Analyze the nature of breakdown mechanism in solid,liquid and gas.
		CO3.Explain the principle of generation of high voltage DC,AC and impulse voltages
		CO4.Explain the principle of measurement of high voltages DC,AC and impulse voltages
		CO5.Select appropriate hardware for testing of power apparatus and insulation coordination.
EE 8702	POWER SYSTEM OPERATION AND CONTROL	CO1.Understand the day-to-day operation of electric power system and analyze the control actions to be implemented on the system to meet the minute-to-minute variation of system demand.
		CO2.Describe the modelling of power frequency dynamics and design the power frequency controller
		CO3.Explain the modelling of reactive power -voltage interaction and the control actions.
		CO4.Solve economic dispatch problems and unit commitment problems in power systems.
		CO5.Explain the need of computer controls for energy management system using SCADA
EE 8703	RENEWABLE ENERGY SYSTEMS	CO1.Understand about renewable Energy Sources and technologies.
		CO2.Explain the various renewable energy resources and technologies and their applications.
		CO3.Recognize current and possible future role of renewable energy sources.
		CO4.Understand basics about biomass energy
		CO5.Acquire adequate inputs on a variety of issues in harnessing renewable Energy.
GE8071	DISASTER MANAGEMENT	CO1.To provide basic conceptual understanding of disasters and its relationships with development.
		CO2.To gain understand approaches of Disaster Risk Reduction (DRR) and the relationship between vulnerability, disasters, disaster prevention and risk reduction.
		CO3.To understand Medical and Psycho-Social Response to Disasters.
		CO4.To prevent and control Public Health consequences of Disasters
		CO5.To enhance awareness of Disaster Risk Management institutional processes in India

Code	Course	Course Outcomes
GE 8077	TOTAL QUALITY MANAGEMENT	CO1.Describe the basic of Basic concepts of TQM and its need , Contributions of Deming, Juran and Crosby , Customer focus, Costs of quality.
		CO2. Explain the Leadership, Quality Councils , Employee involvement, Teamwork, Quality circles , Performance appraisal , PDCA cycle, 5S, Kaizen, Supplier partnership.
		CO3.Compare the different tools of quality, New management tools , Six sigma, Bench marking.
		CO4.Estimate the TQM using Control Charts, Taguchi quality loss function , TPM - Concepts, improvement needs and Performance measures.
		CO5.Apply the knowledge using the various System using ISO 9000 - ISO 9001-2008 , Elements, Documentation, Quality Auditing - QS 9000 - ISO 14000 – Concepts etc.
EE 8711	POWER SYSTEM SIMULATION LABORATORY	CO1.Determine the bus impedance and admittance matrices for analysing the power system network.
		CO2.Apply numerical methods for solving load flow problems using iterative algorithms.
		CO3.Analyze various faults occurring in power system and calculate the fault current.
		CO4.Analyze small signal stability of Single Machine Infinite Bus (SMIB) system and electromagnetic transients in power system.
		CO5.Solve the economic dispatch problems and analyze the load frequency dynamics for single area and two area system.
EE 8712	RENEWABLE ENERGY SYSTEMS LABORATORY	CO1.Understand and analyse Renewable energy systems
		CO2.Provide adequate inputs on a variety of issues in harnessing Renewable Energy.
		CO3.Simulate the various Renewable energy sources.
		CO4.Recognize current and possible future role of Renewable energy sources.
		CO5.Understand basics of Intelligent Controllers.
GE 8076	PROFESSIONAL ETHICS IN ENGINEERING	CO1.Create a basic perception on various moral, human values and ethics.
		CO2.Understand the basic perception of profession, professional ethics, moral issues and the role of ethical theories in engineering field
		CO3.Create an insight of social responsibilities and the code of ethics to be followed by an engineer.
		CO4.Understand the professional rights and responsibilities of an engineer for safety and risk benefit analysis.
		CO5.Acquire knowledge about roles of engineers in various global issues and able to apply ethical principles to resolve situations that arise in their professional lives
EE 8019	SMART GRID	CO1.Apply the concepts of Smart Grid and its present developments.
		CO2.Analyse the different types of Smart Grid technologies
		CO3.Acquire knowledge about different smart meters and advanced metering infrastructure
		CO4. Acquire the knowledge on power quality management in Smart Grids
		CO5.Develop more understanding on LAN, WAN and Cloud Computing for Smart Grid applications.
EE8811	PROJECT WORK	CO1.Apply the fundamentals of mathematics, science and engineering knowledge to identify , formulate , design and investigate complex engineering problems of electrical and electronics engineering and allied applications .
		CO2.Apply appropriate techniques and modern engineering hardware and software tools in electrical and electronics engineering and allied applications.
		CO3.Apply reasoning informed by the contextual knowledge to assess societal , health, safety, legal and cultural issues with societal and environmental context , applying ethical principles in the field of electrical and electronics
		CO4.Function effectively as an individual and as a member or leader in diverse teams in multidisciplinary settings and make effective presentation, and communicate effectively.
		CO5.Demonstrate the understanding of the engineering and management principles in multidisciplinary environments to engage in lifelong learning in the broadest context of technological change.