DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

PROGRAM OUTCOME (POs)	
1.Engineering Knowledge :	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2.Problem Analysis:	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3.Design/development of solutions:	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations
4.Conduct investigations of complex problems:	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5.Modern tool usage:	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6.The engineer and society:	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7.Environment and sustainability:	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8.Ethics:	Apply ethical principles and commit to professional ethics and

	responsibilities and norms of the engineering practice.
9.Individual and team work:	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10.Communication:	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11.Project management and finance:	Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12.Life-long learning	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
(B) PROGRAM SPECIFIC OUTCOME (PSOs)	
PSO1	Ability to Integrate the fundamental knowledge of mathematics, science, electrical engineering to solve complex problems in electrical, electronics and interdisciplinary areas.
PSO2	Ability to design and meet the demands of industry using the state of the art components and software tools

COURSE OUTCOMES

Regulation– 2017 - UG

YEAR/SEMESTER : II/III	
C301/MA8353-TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	
C301.1	Analyze Partial Differential Equations in various methods
C301.2	Solving Fourier Series for different types of functions
C301.3	Computing the solutions of the heat equation, wave equation and the Laplace equation subject to boundary conditions
C301.4	Deduce the Gaussian function in Self reciprocal form using Fourier Transforms
C301.5	Formation of finite difference method in Z-transforms
C302/ EE8351- DIGITAL LOGIC CIRCUITS	
C302.1	Ability to study various number systems and simplify the logical expressions using Boolean functions
C302.2	Ability to design combinational Circuits
C302.3	Ability to design synchronous sequential Circuits
C302.4	Ability to introduce asynchronous sequential circuits and PLDs
C302.5	Ability to introduce digital simulation for development of application oriented logic circuits
C303/ EE8391- ELECTROMAGNETIC THEORY	
C303.1	Ability to understand the basic mathematical concepts related to electromagnetic vector fields
C303.2	Ability to understand the basic concepts about electrostatic fields, electrical potential, energy density and their applications
C303.3	Ability to acquire the knowledge in magneto static fields, magnetic flux density, vector potential and its applications
C303.4	Ability to understand the different methods of emf generation and Maxwell's equations
C303.5	Ability to understand the basic concepts electromagnetic waves and characterizing parameters
C304/ EE8301- ELECTRICAL MACHINES-I	
C304.1	Ability to analyze the magnetic-circuits
C304.2	Ability to acquire the knowledge in constructional details of transformers

C304.3	Ability to understand the concepts of electromechanical energy conversion
C304.4	Ability to acquire the knowledge in working principles of DC Generator
C304.5	Ability to acquire the knowledge in working principles of DC Motor and various losses taking place in D.C. Machines

305/ EE 8353- ELECTRON DEVICES AND CIRCUITS

C305.1	Explain the structure and working operation of basic electronic devices
C305.2	Able to identify and differentiate both active and passive elements
C305.3	Analyze the characteristics of different electronic devices such as diodes and transistors
C305.4	Choose and adapt the required components to construct an amplifier circuit
C305.5	Employ the acquired knowledge in design and analysis of oscillators

C306/ ME8792- POWER PLANT ENGINEERING

C306.1	Explain the layout, construction and working of the components inside a thermal power plant
C306.2	Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants
C306.3	Explain the layout, construction and working of the components inside nuclear power plants
C306.4	Explain the layout, construction and working of the components inside Renewable energy power plants
C306.5	Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production

C307/ EC8311- ELECTRONICS LABORATORY

C307.1	Attain skills in different types of diodes and transistor characteristics and its studies
C307.2	Gain skills of using Common Base, Common Collector, and Common Emitter Configurations
C307.3	Explain and design engineering concept of applications related to photo diode, Light activated relay circuits
C307.4	Categorize and comprehend different types of rectifier
C207.5	Capability to form a group and develop or solve Active and passive filter circuits

C308/ EE8311-ELECTRICAL MACHINES LABORATORY-I

C308.1	Knowledge on performance of DC Shunt and Series Motor
C308.2	Knowledge on the open circuit and load Characteristics of DC generators

C308.3	Acquire skills in testing of transformers
C308.4	Explain and design engineering concept of applications related electromechanical energy conversion
C308.5	Categorize and comprehend different types of DC motor
YEAR/SEMESTER : II/IV	
C401/ MA8491- NUMERICAL METHODS	
C401.1	Understand the basic concepts and techniques of solving algebraic and transcendental equations
C401.2	Appreciate the numerical techniques of interpolation and error approximations in various intervals in real life situations
C401.3	Apply the numerical techniques of differentiation and integration for engineering problems
C401.4	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations
C401.5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications
C402/ EE8401- ELECTRICAL MACHINES – II	
C402.1	Ability to understand the construction and working principle of Synchronous Generator
C402.2	Ability to acquire knowledge on Synchronous motor
C402.3	Ability to understand the construction and working principle of Three phase Induction Motor
C402.4	Ability to understand the various speed control methods of Three phase Induction Motor
C402.5	Ability to understand the construction and working principle of Special Machines
C403/ EE8402- TRANSMISSION AND DISTRIBUTION	
C403.1	Understand the importance and the functioning of transmission line parameters
C403.2	Acquire knowledge on the performance of Transmission lines
C403.3	Understand the concepts of Lines and Insulators
C403.4	Acquire knowledge on Underground Cables
C403.5	Familiar with the function of different components used in Transmission and Distribution levels of power system and modeling of these components
C404/ EE8403- MEASUREMENTS AND INSTRUMENTATION	
C404.1	Acquire knowledge on Basic functional elements of instrumentation

C404.2	Understand the concepts of Fundamentals of electrical and electronic instruments
C404.3	Ability to compare between various measurement techniques
C404.4	Understand the operational features of storage and display Devices
C404.5	Understand the concepts Various transducers and the data acquisition systems
C405/ EE8451- LINEAR INTEGRATED CIRCUITS AND APPLICATIONS	
C405.1	Ability to acquire knowledge in IC fabrication procedure
C405.2	Ability to analyze the characteristics of Op-Amp
C405.3	To understand the importance of Signal analysis using Op-amp based circuits
C405.4	Functional blocks and the applications of special ICs like Timers, PLL circuits, regulator Circuits
C405.5	Ability to understand and analyse, linear integrated circuits their Fabrication and Application
C406/ IC8451- CONTROL SYSTEMS	
C406.1	Ability to develop various representations of system based on the knowledge of Mathematics, Science and Engineering fundamentals
C406.2	Ability to do time domain and frequency domain analysis of various models of linear system
C406.3	Ability to interpret characteristics of the system to develop mathematical model
C406.4	Ability to design appropriate compensator for the given specifications
C406.5	Ability to come out with solution for complex control problem
C407/ EE8411- ELECTRICAL MACHINES LABORATORY - II	
C407.1	Ability to understand and analyze EMF and MMF methods
C407.2	Ability to analyze the characteristics of V and Inverted V curves
C407.3	Ability to understand the importance of Synchronous machines
C407.4	Ability to understand the importance of Induction Machines
C407.5	Ability to acquire knowledge on separation of losses
C408/ EE8461- LINEAR AND DIGITAL INTEGRATED CIRCUITS LABORATORY	
C408.1	Ability to understand and implement Boolean Functions
C408.2	Ability to understand the importance of code conversion
C408.3	Ability to Design and implement 4-bit shift registers
C408.4	Ability to acquire knowledge on Application of Op-Amp
C408.5	Ability to Design and implement counters using specific counter IC
C409/EE8412- TECHNICAL SEMINAR	

C409.1	Review, prepare and present technological developments
C409.2	Face the placement interviews
C409.3	Use various teaching aids such as overhead projectors, power point presentation and demonstrative models
C409.4	Present technical reports
C409.5	Ability to acquire knowledge on communication skills development

YEAR/SEMESTER : III/V	
C501/ EE8501- POWER SYSTEM ANALYSIS	
C501.1	Ability to model the power system under steady state operating condition
C501.2	Ability to understand and apply iterative techniques for power flow analysis
C501.3	Ability to model and carry out short circuit studies on power system
C501.4	Ability to acquire knowledge on Fault analysis
C501.5	Ability to model and understand various power system components and carry out power flow, short circuit and stability studies
C502/ EE8551- MICROPROCESSORS AND MICROCONTROLLERS	
C502.1	Ability to acquire knowledge in hardware architecture of 8085 processor
C502.2	Ability to acquire knowledge in Addressing modes & instruction set of 8085 & 8051
C502.3	Ability to explain the architecture of Microcontroller
C502.4	Ability to understand the importance of Interfacing
C502.5	Ability to write the assembly language programme
C503/ EE8552- POWER ELECTRONICS	
C503.1	Understand basic operation of various power semiconductor devices and passive components
C503.2	Examine and design AC/DC rectifier circuit
C503.3	Investigate and design DC/DC converter circuits
C503.4	Study DC/AC inverter circuit
C503.5	Evaluate and design AC/AC converter circuits
C504/ EE8591- DIGITAL SIGNAL PROCESSING	
C504.1	Ability to acquire knowledge on Signals and systems & their mathematical representation
C504.2	Ability to understand and analyse the discrete time systems
C504.3	Ability to analyse the transformation techniques & their computation
C504.4	Ability to understand the types of filters and their design for digital implementation

C504.5	Ability to acquire knowledge on programmability digital signal processor & quantization effects
C505/ CS8392- OBJECT ORIENTED PROGRAMMING	
C505.1	Develop Java programs using OOP principles
C505.2	Develop Java programs with the concepts inheritance and interfaces
C505.3	Build Java applications using exceptions and I/O streams
C505.4	Develop Java applications with threads and generics classes
C505.5	Develop interactive Java programs using swings
C506/ OAN551- SENSORS AND TRANSDUCERS (OPEN ELECTIVE-I)	
C506.1	Expertise in various calibration techniques and signal types for sensors
C506.2	Apply the various sensors in the Automotive and Mechatronics applications
C506.3	Study the basic principles of various smart sensors
C506.4	Implement the DAQ systems with different sensors for real time applications
C506.5	Understand the fundamentals of signal conditioning, data acquisition and communication systems used in mechatronics system development
C507/ EE8511-CONTROL AND INSTRUMENTATION LABORATORY	
C507.1	Ability to understand control theory and apply them to electrical engineering problems
C507.2	Ability to analyze the various types of converters
C507.3	Ability to design compensators
C507.4	Ability to understand the basic concepts of bridge networks and signal conditioning circuits
C507.5	Ability to study the simulation packages
C508/ HS8581- PROFESSIONAL COMMUNICATION	
C508.1	Take international examination such as IELTS and TOEFL
C508.2	Participate in Group Discussion.
C508.3	Successfully answer questions in Interviews.
C508.4	Make effective Presentations.
C508.5	Participate confidently and appropriately in conversations both formal and informal
C509 / CS8383- OBJECT ORIENTED PROGRAMMING LABORATORY	
C509.1	Develop and implement Java programs for simple applications that make use of classes
C509.2	Develop and implement Java programs for simple applications that make use of packages and interfaces.
C509.3	Develop and implement Java programs with array list, exception handling and

	multi threading
C509.4	Design applications using file processing, generic programming and event handling
C509.5	Develop and implement mini project based on Java programs

YEAR/SEMESTER : III/VI

C601/ EE8601- SOLID STATE DRIVES

C601.1	Ability to study about the steady state operation and transient dynamics of a motor load system
C601.2	Ability to analyse the operation of the converter/chopper fed dc drive
C601.3	Ability to analyse the operation and performance of induction motor drives
C6014	Ability to analyse the operation and performance of synchronous motor drives
C601.5	Ability to analyse and design the current and speed controllers for a closed loop solid state DC motor drive

C602/ EE8602- PROTECTION AND SWITCHGEAR

C602.1	Ability to analyse the characteristics and functions of relays and protection schemes
C602.2	Ability to understand and analyse Electromagnetic and Static Relays
C602.3	Ability to find the causes of abnormal operating conditions of the apparatus and system
C602.4	Ability to study about the apparatus protection, static and numerical relays
C602.5	Ability to suggest suitability circuit breaker

C603/ EE8691- EMBEDDED SYSTEMS

C603.1	Ability to understand and analyse Embedded systems
C603.2	Ability to suggest an embedded system for a given application
C603.3	Ability to operate various Embedded Development Strategies
C603.4	Ability to understand basics of Real time operating system
C603.5	Ability to acquire knowledge on various applications on embedded systems

C604/EE8002-DESIGN OF ELECTRICAL APPARATUS (PROFESSIONAL ELECTIVE-I)

C604.1	Ability to acquire the Knowledge of Engineering fundamentals to the solutions of magnetic circuits
C604.2	Apply the Knowledge of Engineering fundamentals to the design solutions of transformers
C604.3	Apply the Knowledge of Engineering fundamentals to the design solutions of DC machines

C604.4	Apply the Knowledge of Engineering fundamentals to the design solutions of induction motors
C604.5	Apply the Knowledge of Engineering fundamentals to the design solutions of synchronous machines

C605/ EE8005 - SPECIAL ELECTRICAL MACHINES (PROFESSIONAL ELECTIVE-II)	
C605.1	Ability to acquire the knowledge on construction and operation of stepper motor
C605.2	Ability to construction, principle of operation, switched reluctance motors
C605.3	Ability to acquire the knowledge on construction and operation of permanent magnet brushless D.C. motors
C605.4	Ability to acquire the knowledge on construction and operation of permanent magnet synchronous motors
C605.5	Ability to select a special Machine for a particular application

C606/ EE8661- POWER ELECTRONICS AND DRIVES LABORATORY	
C606.1	Ability to practice and understand converter and inverter circuits and apply software for engineering problems
C606.2	Ability to experiment about switching characteristics various switches
C606.3	Ability to analyse about AC to DC converter and DC to AC converters
C606.4	Ability to analyse about DC to AC circuits
C606.5	Ability to acquire knowledge on simulation software

C607/ EE8681- MICROPROCESSORS AND MICROCONTROLLERS LABORATORY	
C607.1	Ability to understand and apply computing platform and software for engineering problems
C6072	Ability to programming logics for code conversion
C607.3	Ability to acquire knowledge on A/D and D/A
C607.4	Ability to understand basics of serial communication
C607.5	Ability to understand basics of software simulators

C608/ EE8611- MINI PROJECT	
C608.1	Students are facilitated to probe into technical issues and solve them effectively in a systematic manner
C608.2	By team work students are able to develop professionalism, built self-confidence and practice ethical responsibilities
C608.3	Intellectual capability and innovating thinking of the students are ignited
C608.4	Acquire proficiency to prepare and present the project report

C608.5	On Completion of the mini project work students will be in a position to take up their final year project work and find solution by formulating proper methodology

YEAR/SEMESTER : IV/VII

C701/ EE8701- HIGH VOLTAGE ENGINEERING

C701.1	Ability to understand Transients in power system
C701.2	Ability to understand Generation and measurement of high voltage
C701.3	Ability to understand High voltage testing
C701.4	Ability to understand various types of over voltages in power system
C701.5	Ability to test power apparatus and insulation coordination

C702/ EE8702- POWER SYSTEM OPERATION AND CONTROL

C702.1	Ability to understand the day-to-day operation of electric power system
C702.2	Ability to analyse the control actions to be implemented on the system to meet the minute-to-minute variation of system demand
C702.3	Ability to understand the significance of power system operation and control
C702.4	Ability to acquire knowledge on real power-frequency interaction
C702.5	Ability to design SCADA and its application for real time operation

C703/ EE8703- RENEWABLE ENERGY SYSTEMS

C703.1	Ability to create awareness about renewable Energy Sources and technologies
C703.2	Ability to get adequate inputs on a variety of issues in harnessing renewable Energy
C703.3	Ability to acquire knowledge about solar energy
C703.4	Ability to understand basics about biomass energy
C703.5	Ability to recognize current and possible future role of renewable energy sources

C704/ OML751 TESTING OF MATERIALS (OPEN ELECTIVE-II)

C704.1	Understand the various testing standards and materials
C704.2	To understand the various destructive testing methods of materials and itsindustrial applications
C704.3	To understand the various non-destructive testing methods of materials and its industrial applications
C704.4	Identify suitable testing technique to inspect industrial component
C704.5	Ability to use the different technique and know its applications and limitations

C705/ GE8071- DISASTER MANAGEMENT (PROFESSIONAL ELECTIVE-III)

C705.1	Ability to get an exposure to disasters, their significance and types
C705.2	Understand the preliminary approaches of Disaster Risk Reduction

C705.3	Understand the relationship between vulnerability, disasters, disaster prevention and risk reduction
C705.4	Ability to analyse the awareness of institutional processes in the country
C705.5	Understand the Disasterdamage assessment and management
C706/ GE8077- Total Quality Management (Professional Elective-IV)	
C706.1	Define the need and dimensions of quality in Engineering practice
C706.2	Explain the TQM principles such as leadership, quality plan, customer focus, employee involvement and six sigma concepts
C706.3	Discuss the benchmarking process and various stages of FMEA
C706.4	Describe various tools and techniques of TQM such as QFD, Taguchi quality loss function and TPM
C706.5	Illustrate the need of ISO 9000, QS 9000, ISO 14000 quality system elements, documentation and quality audit
C707/ EE8711- POWER SYSTEM SIMULATION LABORATORY	
C707.1	Ability to understand power system planning and operational studies
C707.2	Ability to acquire knowledge on Formation of Bus Admittance and Impedance Matrices and Solution of Networks
C707.3	Ability to analyse the power flow using GS and NR method
C707.4	Ability to find Symmetric and Unsymmetrical fault
C707.5	Ability to understand the economic dispatch
C708/ EE8712- RENEWABLE ENERGY SYSTEMS LABORATORY	
C708.1	Ability to understand and analyse Renewable energy systems
C708.2	Ability to train the students in Renewable Energy Sources and technologies
C708.3	Ability to provide adequate inputs on a variety of issues in harnessing Renewable Energy
C708.4	Ability to recognize current and possible future role of Renewable energy sources
C708.5	Ability to understand basics of Intelligent Controllers
YEAR/SEMESTER : IV/VIII	
C801/ MG8591-PRINCIPLES OF MANAGEMENT (Professional Elective– V)	
C801.1	Explain the managerial roles in local and global organization, environmental factors &Strategies for International business.
C801.2	Ability to understand basics of planning process, tools and techniques
C801.3	Illustrate the different organization structure to recognize the human resources planning and management

C801.4	Demonstrate the creativity, innovation and leadership styles through the principles of effective communication and organization culture
C801.5	Explain the process of control authority, budget preparation, productivity measurement and planning operations in management
C802/ EI8073- BIOMEDICAL INSTRUMENTATION (PROFESSIONAL ELECTIVE– VI)
C802.1	Ability to understand the philosophy of the heart, lung, blood circulation and respiration system
C802.2	Ability to provide latest ideas on devices of non-electrical devices
C802.3	Ability to gain knowledge on various sensing and measurement devices of electrical origin
C802.4	Ability to bring out the important and modern methods of imaging techniques and their analysis
C802.5	Ability to explain the medical assistance/techniques, robotic and therapeutic equipments
C803/ EE8811-PROJECT WORK
C803.1	Capable to apply the fundamental knowledge of Electrical and Electronics Engineering in developing novel products/solutions and thereby contributing to society
C803.2	Intellectual capability and innovating thinking of the students are ignited
C803.3	Determine and capable to adapt in a group so that they can communicate among themselves thereby sharpen their leadership skills to do their project work
C803.4	Students become capable of designing and developing system prototypes independently by utilizing latest software's and equipment's
C803.5	Explore the possibility of publishing papers in peer reviewed journals/conference proceedings