

## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

<b>PROGRAM OUTCOME (POs)</b>	
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 sustainability:	and	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.

**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– 2021 - UG**

<b>YEAR/SEMESTER : II/III</b>	
<b>C301/ MA3303 Probability and Complex Functions</b>	
C301.1	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.
C301.2	Understand the basic concepts of one and two dimensional random variables and apply in engineering applications.
C301.3	To develop an understanding of the standard techniques of complex variable theory in particular analytic function and its mapping property.
C301.4	To familiarize the students with complex integration techniques and contour integration techniques which can be used in real integrals.
C301.5	To acquaint the students with Differential Equations which are significantly used in engineering problems.
<b>C302/ EE3301 Electromagnetic Fields</b>	
C302.1	Categorize Gradient, Divergence, and Curl operations on electromagnetic vector fields.
C302.2	Analyze electrostatic fields, electric potential, energy density and their applications
C302.3	Identify magneto static fields, magnetic flux density, vector potential
C302.4	Apply different methods of emf generation and Maxwell's equations
C302.5	Contrast the concept of electromagnetic waves and characterizing parameters
<b>C303/ EE3302 Digital Logic Circuits</b>	

C303.1	Explain various number systems and characteristics of digital logic families and Apply K-maps and Quine McCluskey methods to simplify the given Boolean expressions
C303.2	Explain the implementation of combinational circuit such as multiplexers and demultiplexers, code converters, adders, subtractors, encoders and Decoders
C303.3	Design various synchronous sequential circuits using Flip Flops
C303.4	Design asynchronous sequential circuits and programmable logic devices
C303.5	Use VHDL for simulating and testing RTL, combinational and sequential circuits

### **C304/ EC3301 Electron Devices and Circuits**

C304.1	Explain the structure and operation of PN junction devices (diode, Zener diode, LED and Laser diode)
C304.2	Design clipper, clamper, half wave and full wave rectifier, regulator circuits using PN junction diodes
C304.3	Analyze the structure and characteristics BJT, FET, MOSFET, UJT, Thyristor and IGBT
C304.4	Analyze the performance of various configurations of BJT and MOSFET based amplifier
C304.5	Explain the characteristics of MOS based cascade and differential amplifier
C304.6	Explain the operation of various feedback amplifiers and oscillators

### **C305/ EE3303 Electrical Machines - I**

C305.1	Apply the laws governing the electromechanical energy conversion for singly and multiple excited systems
C305.2	Explain the construction, working principle and various characteristics of DC Generator
C305.3	Explain the construction, working principle and various characteristics of DC Motor

C305.4	Draw the equivalent circuit of transformer and predetermine the efficiency and regulation
C305.5	Describe the working principle of auto transformer, three phase transformer with different types of connections
<b>C306/ CS3353 C PROGRAMMING AND DATA STRUCTURES</b>	
C306.1	Develop C programs for any real world/technical application.
C306.2	Apply advanced features of C in solving problems.
C306.3	Write functions to implement linear and non-linear data structure operations
C306.4	Suggest and use appropriate linear/non-linear data structure operations for solving a given problem.
C306.5	Appropriately use sort and search algorithms for a given application and apply appropriate hash functions that result in a collision free scenario for data storage and retrieval.
<b>C307/ EC3311 Electronic Devices and Circuits Laboratory</b>	
C307.1	Analyze the characteristics of PN, Zener diode, BJT in CE,CC, CB configurations, JFET,UJT, FET based differential amplifier experimentally
C307.2	Analyze frequency response characteristics of a Common Emitter amplifier and passive filters experimentally
C307.3	Analyze the characteristics of RC phase shift and LC oscillators experimentally
C307.4	Analyze the characteristics of half-wave and full-wave rectifier with and without filters experimentally

C307.5	Calculate the frequency and phase angle of waveforms using CRO experimentally
<b>C308/ EE3311 Electrical Machines Laboratory-I</b>	
C308.1	Construct the circuit with appropriate connections for the given DC machine/transformer.
C308.2	Experimentally determine the characteristics of different types of DC machines.
C308.3	Demonstrate the speed control techniques for a DC motor for industrial applications.
C308.4	Identify suitable methods for testing of transformer and DC machines.
C308.5	Predetermine the performance parameters of transformers, DC motors and understand DC motor starters and 3-phase transformer connections.
<b>C309/ CS3362 C PROGRAMMING AND DATA STRUCTURES LABORATORY</b>	
C309.1	Use different constructs of C and develop applications
C309.2	Write functions to implement linear and non-linear data structure operations
C309.3	Suggest and use the appropriate linear / non-linear data structure operations for a given problem
C309.4	Apply appropriate hash functions that result in a collision free scenario for data storage and Retrieval
C309.5	Implement Sorting and searching algorithms for a given application
<b>YEAR/SEMESTER : II/IV</b>	
<b>C401/ GE3451 Environmental Sciences and Sustainability</b>	

C401.1	Study the scope and importance of the environment and biodiversity
C401.2	Gain knowledge on causes, effects, and preventive measures for environmental pollution and environmental protection
C401.3	Apply the concepts of energy management and conservation using renewable sources of energy
C401.4	Develop practices for sustainable development and climate change mitigation
C401.5	Plan an environmental impact assessment and apply green engineering concepts for environmental management
<b>C402/ EE3401 Transmission and Distribution</b>	
C402.1	Understand the importance and the functioning of transmission line parameters
C402.2	Acquire knowledge on the performance of Transmission lines
C402.3	Understand the mechanical design and concepts of transmission Lines and Insulators
C402.4	Acquire knowledge on Underground Cables
C402.5	Familiar with the function of different components used in Distribution system
<b>C403/ EE3402 Linear Integrated Circuits</b>	
C403.1	Explain monolithic IC fabrication process and fabrication of diodes, capacitance, resistance, FETs and PV Cell
C403.2	Analyze the characteristics and basic applications (inverting/non-inverting amplifier, summer, differentiator, integrator, V/I and I/V converter) of Op-Amp
C403.3	Explain circuit and applications of op-amp based instrumentation amplifier, log/antilog amplifier, analog multiplier /divider, active filters, comparators, waveform generators, A/D and D/A converters

C403.4	Explain Functional blocks, characteristics and applications of Timer, PLL, analog multiplier ICs
C403.5	Explain the applications of ICs in Instrumentation amplifier, fixed and variable voltage regulators, SMPS and function generator
<b>C404/ EE3403 Measurements and Instrumentation</b>	
C404.1	Understand the fundamental art of measurement in engineering.
C404.2	Understand the structural elements of various instruments.
C404.3	Understand the importance of bridge circuits.
C404.4	Understand about various transducers and their characteristics by experiments
C404.5	Understand the concept of digital instrumentation and virtual instrumentation by experiments

<b>C405/ EE3404 Microprocessor and Microcontroller</b>	
C405.1	Ability to understand the architecture of 8085 microprocessor
C405.2	Ability to write assembly language program for 8085 microprocessor
C405.3	Ability to design and implement interfacing of peripheral with microprocessor
C405.4	Ability to analyze, comprehend, design and simulate microcontroller-based systems used for control and monitoring
C405.5	Ability to understand and appreciate advanced architecture evolving microprocessor field
<b>C406/ EE3405 Electrical Machines - II</b>	



C406.1	Ability to understand the construction and working principle of Synchronous generator.
C406.2	Ability to understand the construction and working principle of Synchronous Motor.
C406.3	Ability to understand the construction and working principle of Three Phase Induction Motor
C406.4	Acquire knowledge about the starting and speed control of induction motors.
C406.5	To gain knowledge about the basic principles and working of Single phase induction motors and Special Electrical Machines.
C407/ EE3411 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	Acquire hands-on experience of conducting various tests on alternators and obtaining their performance indices using standard analytical as well as graphical methods. to understand the importance of Synchronous machines.
C407.4	Acquire hands-on experience of conducting various tests on alternators and obtaining their performance indices using standard analytical as well as graphical methods. to understand the importance of single and three phase Induction motors.
C407.5	Ability to acquire knowledge on separation of losses.
C408/ EE3412 Linear and Digital 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 circuits with digital ICs like decoders, multiplexers, registers

C408.4	Ability to acquire knowledge on Application of Op-Amp
C408.5	Ability to Design and implement counters using analog ICs like timers, VCOs and digital ICs like Flip-flops and counters.

**C409/ EE3413 Microprocessor and Microcontroller laboratory**

C409.1	Ability to write assembly language program for microprocessor
C409.2	Ability to write assembly language program for microcontroller
C409.3	Ability to design and implement interfacing of peripheral with microprocessor and microcontroller
C409.4	Ability to analyze, comprehend, design and simulate microprocessor based systems used for control and monitoring
C409.5	Ability to analyze, comprehend, design and simulate microcontroller based systems used for control and monitoring.