

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**List of Subjects:**

S.No.	Course code	Subject code	Course Name
<b>Semester I</b>			
1.	C101	HS8151	Communicative English
2.	C102	MA8151	Engineering Mathematics – I
3.	C103	PH8151	Engineering Physics
4.	C104	CY8151	Engineering Chemistry
5.	C105	GE8151	Problem Solving and Python Programming
6.	C106	GE8152	Engineering Graphics
7.	C107	GE8161	Problem Solving and Python Programming Laboratory
8.	C108	BS8161	Physics and Chemistry Laboratory
<b>Semester II</b>			
9.	C109	HS8251	Technical English
10.	C110	MA8251	Engineering Mathematics – II
11.	C111	PH8253	Physics for Electronics Engineering
12.	C112	BE8252	Basic Civil and Mechanical Engineering
13.	C113	EE8251	Circuit Theory
14.	C114	GE8291	Environmental Science and Engineering
15.	C115	GE8261	Engineering Practices Laboratory
16.	C116	EE8261	Electric Circuits Laboratory
<b>Semester III</b>			
17.	C201	MA8353	Transforms and Partial Differential Equations
18.	C202	EE8351	Digital Logic Circuits
19.	C203	EE8391	Electromagnetic Theory
20.	C204	EE8301	Electrical Machines – I
21.	C205	EC8353	Electron Devices and Circuits
22.	C206	ME8792	Power Plant Engineering
23.	C207	EC8311	Electronics Laboratory
24.	C208	EE8311	Electrical Machines Laboratory – I
<b>Semester IV</b>			
25.	C209	MA8491	Numerical Methods
26.	C210	EE8401	Electrical Machines - II
27.	C211	EE8402	Transmission and Distribution
28.	C212	EE8403	Measurements and Instrumentation
29.	C213	EE8451	Linear Integrated Circuits and Applications
30.	C214	IC8451	Control Systems
31.	C215	EE8411	Electrical Machines Laboratory – II
32.	C216	EE8461	Linear and Digital Integrated Circuits Laboratory
<b>Semester V</b>			
33.	C301	EE8501	Power System Analysis
34.	C302	EE8551	Microprocessors and Microcontrollers
35.	C303	EE8552	Power Electronics
36.	C304	EE8591	Digital Signal Processing
37.	C305	CS8392	Object Oriented Programming
38.	C306	OAN551	Sensors and Transducers (Open Elective-I)

39.	C307	EE8511	Control and Instrumentation Laboratory
40.	C308	HS8581	Professional Communication
41.	C309	CS8383	Object Oriented Programming Laboratory
42.	C217	EE8412	Technical Seminar
<b>Semester VI</b>			
43.	C310	EE8601	Solid State Drives
44.	C311	EE8602	Protection and Switchgear
45.	C312	EE8691	Embedded Systems
46.	C313	EE8003	Design of Electrical Apparatus (Professional Elective I)
47.	C314	EE8005	Special Electrical Machines(Professional Elective II)
48.	C315	EE8661	Power Electronics and Drives Laboratory
49.	C316	EE8681	Microprocessors and Microcontrollers Laboratory
50.	C317	EE8611	Mini Project

**Course Outcomes of all subjects**

**Year/Sem: I/I**

<b>HS8151-Communicative English (C101)</b>	
C101.1	Understand clearly, confidently, comprehensibly, and communicate with one or many listeners using appropriate communicative strategies
C101.2	Analyzing cohesively and coherently and flawlessly avoiding grammatical errors, using a wide vocabulary range, organizing their ideas logically on a topic
C101.3	Create different genres of texts adopting various reading strategies
C101.4	Understand different spoken discourses and different accents
C101.5	Understand intonations of the speaker while communicating as well as development of creative writing.

<b>MA8251- Engineering Mathematics (C102)</b>	
C102.1	Use both the limit definition and rules of differentiation to differentiate functions.
C102.2	Apply differentiation to solve maxima and minima problems.
C102.3	Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.
C102.4	Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts.
C102.5	Apply various techniques in solving differential equations.

<b>PH8151-Engineering Physics (C103)</b>	
C103.1	Remember the properties of matter and its applications.
C103.2	Understand the concepts of waves and optical devices and its applications.
C103.3	Analyze the thermal properties of materials and their applications
C103.4	Apply the advanced physics concepts of quantum theory
C103.5	Remember the various crystal structures and its growth techniques.

<b>CY8151-Engineering Chemistry (C104)</b>	
C104.1	Gain knowledge on the water quality parameters.
C104.2	Understand the types of catalysis & Identify the applications of adsorption.
C104.3	Analyse the types of phase in a system & various alloys
C104.4	Evaluate the characteristics of various fuels & its applications.
C104.5	Achieve the knowledge about various energy sources & its applications.

<b>GE8151-Problem Solving And Python Programming (C105)</b>	
C105.1	Develop algorithmic solutions to simple computational problems
C105.2	Read, write, execute by hand simple Python programs.
C105.3	Decompose a Python program into functions.
C105.4	Represent compound data using Python lists, tuples, and dictionaries.
C105.5	Read and write data from/to files in Python Programs.

<b>GE8152-Engineering Graphics (C106)</b>	
C106.1	Effectively understand the practical applications of conics, special curves and freehand sketching.
C106.2	Implement the drawing skills in points, lines and planes.
C106.3	Enhance the solid projections in pyramid, prisms, cylinder and cones.
C106.4	Understand clearly the concepts of sectioning and development of solids in pyramid, prisms, cylinder and cones.
C106.5	Improve the engineering knowledge in frustum & truncated solids, visual ray methods.

<b>GE8161-Problem Solving and Python Programming Laboratory (C107)</b>	
C107.1	Develop algorithmic solutions to simple computational problems, Write, test, and debug simple Python programs.
C107.2	Read, write, execute by handle simple Python programs, Implement Python programs with conditionals and loops.
C107.3	Develop Python programs step-wise by defining functions and calling them.
C107.4	Use Python lists, tuples, dictionaries for representing compound data.
C107.5	Read and write data from/to files in Python

<b>BS8161-Physics And Chemistry Laboratory (C108)</b>	
C108.1	Analyze the characteristics of engineering materials.
C108.2	Find out the physical properties of matter
C108.3	Access the water quality parameters
C108.4	Analyse the PH of aqueous solutions
C108.5	Gain the knowledge on chemical properties of liquids.

**Year/Sem: I/II**

<b>HS8251-Technical English (C109)</b>	
C109.1	Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, and argue using appropriate communicative strategies.
C109.2	Recognize to frame effective types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing to determine their writing skill.
C109.3	Attribute to read different genres of texts, infer implied meanings and critically analyse and evaluate them for ideas as well as for method of presentations.
C109.4	Listen different spoken excerpts critically and infer unspoken and implied meanings
C109.5	Analyze to participantinagroupdiscussion and understandingtechnicalarticles.

<b>MA8251-Engineering Mathematics-II (C110)</b>	
C110.1	Eigen values and eigenvectors, Diagonalization of a matrix, Symmetric matrices, positive definite matrices and similar matrices
C110.2	Generalize about vector differentiation, line, surface and volume integrals and theorems involving them.
C110.3	Examine analytic functions and its properties, conformal mapping and its applications.
C110.4	Summarize the concepts of complex integration.

C110.5	Use knowledge of Laplace transform and its properties, inverse Laplace transform to solve linear differential equations.
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<b>PH8253-Physics for Electronics Engineering (C111)</b>	
C111.1	Remember the Electrical and thermal conductivity of the metal and also gain knowledge on the basics of conducting materials and its applications.
C111.2	Understand the concepts of electrons, holes, Hall effect, semiconductor and their applications.
C111.3	Understand the concepts of magnetic, dielectric, ferro electric materials and its applications.
C111.4	Analysis the Photo diode, Solar cell, LED, OLED and LASER diode and its applications.
C111.5	Understand the basics of quantum well, quantum wire and quantum dots, spintronics, SET, CNT and their applications.

<b>BE8252-Basic Civil and Mechanical Engineering (C112)</b>	
C112.1	Effectively understand the practical applications of surveying and civil engineering materials.
C112.2	An ability to identify, formulate and solve engineering problems
C112.3	Understand the energy sources and working principle of power plants and apply the knowledge of power plants to diagnose and solve the Engineering problem.
C112.4	Understand the working principle of IC Engines, pumps, boilers.
C112.5	Understand the function of refrigeration and air conditioning system.

<b>EE8251-Circuit Theory (C113)</b>	
C113.1	Able to explain the basic concepts of electric circuits and its analysis method
C113.2	Describe and analyze the electric circuits by applying network theorems
C113.3	Examine and summarize the transient response of RL, RC and RLC circuits using Laplace transform
C113.4	Apply the basic concept for analyzing the three phase AC circuits
C113.5	Analyze and compare the response of series, parallel and tuned resonant circuits

<b>GE8291-Environmental Science and Engineering (C114)</b>	
C114.1	Gain knowledge on public awareness & about the Environment & Ecosystem.
C114.2	Identify the impacts of Pollution.
C114.3	Achieve Sustainable development.
C114.4	Analyze about the social issues in the Environment.
C114.5	Apply the knowledge to tackle the problems of over population.

<b>GE8261-Engineering Practices Laboratory (C115)</b>	
C115.1	Apply the knowledge of pipeline connections to household fittings and Industrial buildings & use wiring circuit for Residential House, Fluorescent Lamp and Stair Case.
C115.2	Identify electrical Quantities of V, I & PF in RLC and Energy with Single Phase Energy meter.
C115.3	Demonstrate Logic Gates and Electronic components.
C115.4	Demonstrate PCB with Electronic components, devices, circuits for general purposes.
C115.5	Demonstrate HWR & FWR with ripple factor & test for generation of clock signal.

<b>EE8261-Electric Circuits Laboratory</b>	
C116.1	Able to construct and solve the circuit problems by using circuit laws
C116.2	Apply and analyze the electric circuits by applying network theorems
C116.3	Observe the transient response of RC and RLC circuits
C116.4	Enumerate the significance of resonant circuits
C116.5	Acquire the skills on the working of CRO and star-delta networks

**Year/Sem: II/III**

<b>MA8353-Transforms and Partial Differential Equations (C201)</b>	
C201.1	Formulate and solve first and higher order partial differential equations
C201.2	Compute Fourier Series of periodic functions
C201.3	Analyze one dimensional wave equation. One and two dimensional heat equations in Cartesian coordinates.
C201.4	Compute infinite Fourier transforms and evaluate integrals using inverse Fourier transform and Parseval's identity
C201.5	Classify the difference equation and solve them using Z- transform techniques

<b>EE8351-Digital Logic Circuits (C202)</b>	
C202.1	Understand the various number systems and simplify the logical expressions using Boolean functions
C202.2	Ability to design synchronous sequential circuit
C202.3	Solve and design combination logic circuit using different simplification technique
C202.4	Ability to design asynchronous sequential circuit and Programmable logic circuits and also identify to prevent various hazards in a digital design
C202.5	Develop skill to build, and troubleshoot digital circuits using VHDL

<b>EE8391-Electromagnetic Theory (C203)</b>	
C203.1	Understand the basic mathematical concepts related to electromagnetic vector fields.
C203.2	Interpret the concepts of Electrostatic fields and apply boundary conditions on Electrostatic field.
C203.3	Develop concepts of magneto static fields, magnetic flux density, vector potential and its applications.
C203.4	Determine relationship between the Time Varying Electric and Magnetic Field
C203.5	Understand and compute Electromagnetic fields and apply them for design and analysis of electrical equipment and systems

<b>EE8301-Electrical Machines - I (C204)</b>	
C204.1	Understand and analysis the constructional details and principle of operation of DC machines and transformer.
C204.2	Analyze the performance of DC machines under various operating condition.
C204.3	Evaluate performance of the transformer and analysis using phasor diagrams and equipment circuit.
C204.4	Analyze various DC motor to select suitable speed control method.
C204.5	Ability to understand the concept of electromagnetic system versus rotating machine.

<b>EC8353-Electron Devices and Circuits (C205)</b>	
C205.1	Explain the structure and working operation of basic electronic devices.
C205.2	Identify and differentiate both active and passive elements
C205.3	Analyze the characteristics of different electronic devices such as diodes and transistors
C205.4	Choose and adapt the required components to construct an amplifier circuit.
C205.5	Employ the acquired knowledge in design and analysis of oscillators

<b>ME8792-Power Plant Engineering (C206)</b>	
C206.1	Describe and analyzedifferent types of sources and mathematical expressions related to thermodynamics and various terms and factors involved with power plant operation.
C206.2	Calculate the performance of gas turbines with reheat and regeneration, and discuss the performance of combined cycle power plants.
C206.3	Gain knowledge of working of Nuclear power plant including working of different types of reactors and safety measures.
C206.4	Able to know which sources of energy will best in future to meet up the energy demand.
C206.5	Extend their knowledge to power plant economics and environmental hazards .

<b>EC8311-Electronics Laboratory (C207)</b>	
C207.1	Understand the working and characteristics of semiconductor diodes
C207.2	Analyze the characteristics of various types of transistors
C207.3	Realize the operation and characteristics of an amplifier circuits
C207.4	Construct the various oscillator circuits
C207.5	Design and analyze the rectifier circuits using simulation software

<b>EE8311-Electrical Machines Laboratory-I</b>	
C208.1	Interpret the performance of the DC generator for different condition.
C208.2	Compare the performance of DC Machine (Shunt, Series &Compound)
C208.3	Apply and analysis the suitable test on single phase transformer evaluate the performance.
C208.4	Enumerate the significance of given DC machine and transformer using predetermine test.
C208.5	Compare and analysis the impact of starter and three phase transformer connection.

**Year/Sem: II/IV**

<b>MA8491-Numerical Methods (C209)</b>	
C209.1	Apply various techniques to solve Algebraic and Transcendental equations
C209.2	Can approximate the value of a function which is not known explicitly by interpolation
C209.3	Enable to solve complicated differentiation and integration problems numerically.
C209.4	Provides knowledge to solve first order differential equations by various methods
C209.5	Intends to analyze the application of boundary value problems

<b>EE8401-Electrical Machines-II (C210)</b>	
C210.1	Explain the constructional feature and principle of operation of an alternator and predetermine the voltage regulation of synchronous machine
C210.2	Describe about the starting methods of synchronous motor and the effects of excitation on armature current and power factor of synchronous motor
C210.3	Illustrate the constructional features and working principle of a 3-phase induction motor and develop an equivalent circuit of a 3 phase induction motor
C210.4	Compare the different starting methods of three phase squirrel cage and slip ring induction motors with merits and demerits
C210.5	Describe the constructional feature and principle of operation of special motors with applications

<b>EE8402-Transmission and Distribution (C211)</b>	
C211.1	Explain the structure of power system and calculate the value of line inductance and capacitance for different configurations
C211.2	Summarize the modeling of transmission and distribution system and its

	performance
C211.3	Apply the basic concepts for performance evaluation of various insulators used for overhead lines
C211.4	Compare different types of cables based on types and performance
C211.5	Explain various types of distribution systems, grounding techniques, substation types and trends in EHVAC, HVDC and FACTS.

<b>EE8403-Measurements and Instrumentation (C212)</b>	
C212.1	Describe the basic functional block elements in different measuring Instruments
C212.2	Explain the operation of instruments for the measurement of electrical and magnetic parameters
C212.3	Design the various bridge circuits for the measurement of electrical quantities
C212.4	Able to explain the construction and working principle of various types of storage and display devices
C212.5	Compare the various types of transducers and its functions in data acquisition systems

<b>EE8451-Linear Integrated Circuits and Applications (C213)</b>	
C213.1	Ability to learn knowledge in IC fabrication techniques.
C213.2	Ability to analyze the characteristics of Op-Amp.
C213.3	Understanding the importance of Signal analysis using Op-amp based circuits.
C213.4	Functional blocks and the applications of special ICs like Timers, PLL circuits, regulator Circuits.
C213.5	To understand and acquire knowledge on the Applications of voltage regulators power amplifier and function generators

<b>IC8451-Control Systems (C214)</b>	
C214.1	Explain the uses of transfer function models for analyzing physical systems and relate the control system components.
C3214.2	Develop adequate knowledge in the time response of systems, steady state error analysis. And also to build the basics concept of controllers, root locus for stability studies.
C214.3	Distinguish the basic knowledge in obtaining the open loop and closed-loop frequency responses of systems
C214.4	Evaluate the basics of stability studies by various techniques and design of compensator using frequency response analysis
C214.5	Demonstrate the concept of state variable analysis to evaluate the feedback control and the concept of Controllability, observability using state space representation

<b>EE8411- Electrical Machines Laboratory – II(C215)</b>	
C215.1	Able to understand the experimental procedure for testing the different types of AC machines.
C215.2	Modeling the equivalent circuit parameters and evaluating the performance parameters of the various AC machines
C215.3	Analyzing the laboratory experimental results, computational results and incorporating the data by graphical interpretation.
C215.4	Able to conduct the experiment in a team to analyze and produce the result.
C215.5	Able to create the report and communicate effectively by professional engineering practice

<b>EE8461-Linear and Digital Integrated Circuits Laboratory (C216)</b>	
C216.1	Understand and implement the Boolean functions and usage of code converters.
C216.2	Design and implement the synchronous and asynchronous of counters
C216.3	To acquire knowledge on Application of Op-Amp
C216.4	To design and implement 4 bit shift registers

C216.5	To know about the application mux, demux encoder and decoders
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**Year/Sem: III/V**

<b>EE8501-Power System Analysis (C301)</b>	
C301.1	Understand the various power system components and modelling under steady state operating condition
C301.2	Solve the power flow problem by applying numerical method
C301.3	Illustrate the types of faults and their effects and able to calculate the fault currents for symmetrical fault condition
C301.4	Analyze and calculate the unsymmetrical faults occurring at various locations in power system
C301.5	Analyze the stability of single machine infinite bus system and explain the concepts of power system stability

<b>EE8551-Microprocessor and Microcontrollers (C302)</b>	
C302.1	Understand the architecture, Timing diagram and Interrupts of 8085 Microprocessor.
C302.2	Impart the knowledge about the instruction set and develop skill in simple program writing of 8085.
C302.3	Understand the architecture, Pinouts and I/O ports of 8051 Microcontroller.
C302.4	Design Interfacing devices with 8051 Microcontroller.
C302.5	Design and implement microprocessor and Microcontroller based applications.

<b>EE8552-Power Electronics (C303)</b>	
C303.1	Define the power semiconductor devices
C303.2	Explain the nature of the operation in converters
C303.3	Apply various PWM techniques to the inverter
C303.4	Remember the various control strategy schemes for chopper fed drives
C303.5	Evaluate the characteristics and control methods for cyclo converter and voltage regulators

<b>EE8591-Digital Signal Processing (C304)</b>	
C304.1	Acquiring the knowledge on signals and systems and their mathematical representation
C304.2	Applying Z Transformation to Discrete Time Systems.
C304.3	Understanding the importance of Fourier transform
C304.4	Understanding the design of Digital Filters and their design for digital implementation.
C304.5	Acquiring the knowledge on programmability digital signal processor.

<b>CS8392-Object Oriented Programming (C305)</b>	
C305.1	To Write simple programs using object oriented concepts.
C305.2	To Design a program with inheritance and interface concepts
C305.3	To Build java applications using exceptions and I/O streams.
C305.4	To Develop java applications with threads and generic classes.
C305.5	To Build interactive programs using java swings.

<b>OAN551-Sensors and Transducers (C306)</b>	
C306.1	Expertise in various calibration techniques and signal types for transducers.
C306.2	Understand the basic principles of various smart sensors.
C306.3	Apply the various sensors in the Automotive and Mechatronics applications
C306.4	Analyze the fundamentals of signal conditioning, data acquisition and communication systems used in mechatronics system development.

C306.5	Implement the DAQ systems with different sensors for real time applications.
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<b>EE8511-Control and Instrumentation Laboratory (C307)</b>	
C307.1	Evaluate the electrical quantity for different sensors and transducers
C307.2	Determine the unknown resistance, Inductance and capacitance values by the help of various bridges
C307.3	Analysis the characteristics of special machineries and determine the transfer function of the machine
C307.4	Analysis the stability of different order of the system by using different methodologies
C307.5	Design the Lag, Lead and Lag-Lead Compensators and different types of controllers

<b>HS8581-Professional Communication (C308)</b>	
C308.1	Apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.
C308.2	Use presentation skills to develop their professional values
C308.3	Develop their interactive skills among group in successful manner
C308.4	Attend interviews with self-confidence
C308.5	Manage stress and time while attending an interview

<b>CS8383-Object Oriented Programming Laboratory (C309)</b>	
C309.1	Analyze the necessity for Object Oriented Programming paradigm.
C309.2	Demonstrate an ability to design and develop java programs, analyze, and interpret data to apply inheritance and interface concepts.
C309.3	Demonstrate an ability to design an object oriented system with exception handling to resolve run time error and handle large data set using files
C309.4	Analyze the need of generic data type independent programming or multithreaded process as per needs and specifications.
C309.5	Demonstrate an ability to visualize multidisciplinary tasks like console and windows applications both for standalone and AWT program.

**Year/Sem: III/VI**

<b>EE8601-Solid State Drives (C310)</b>	
C310.1	Impart the construction and performance of synchronous reluctance motors in industries.
C310.2	Understand the performance of the stepper motors and its characteristics.
C310.3	Explain the Construction, principle of operation, control and performance of switched reluctance motor
C310.4	Illustrate the Nature of BLDC motor performances and its applications.
C310.5	Describe the knowledge about the Construction, principle of operation and performance of permanent magnet synchronous motors

<b>EE8602-Protection and Switchgear (C311)</b>	
C311.1	Classify the various causes of abnormal operating conditions and their protection schemes.
C311.2	Construct the characteristics and functions of electromagnetic relays and their protection schemes.
C311.3	Apply the basic concept of various apparatus protection in the power system.
C311.4	Evaluate the various static and numerical relays and their protection schemes.
C311.5	Elaborate the concept on functioning of circuit breakers in power system.

<b>EE8691-Embedded Systems (C312)</b>	
C312.1	Understand the basic concept of embedded system design using modeling language
C312.2	Gain knowledge of embedded networking and its applications
C312.3	Understand the concept of embedded firmware development environment
C312.4	Analyze the different types of real time in static and dynamic system
C312.5	Apply the knowledge of system design in different types of embedded applications

<b>EE8003-Design of Electrical Apparatus (C313)</b>	
C313.1	Exhibit the knowledge on the design of magnetic circuit of electric machines
C313.2	Capability to manipulate design aspects of Transformers
C313.3	Ability to analyze and design the major parts of DC machines
C313.4	Ability to predict the operating characteristics of induction motor
C313.5	Perceive knowledge on designing of synchronous machines and its output characteristics

<b>EE8005-Special Electrical Machines (C314)</b>	
C314.1	Impart the construction and performance of synchronous reluctance motors in industries.
C314.2	Understand the performance of the stepper motors and its characteristics.
C314.3	Explain the Construction, principle of operation, control and performance of switched reluctance motor
C314.4	Illustrate the Nature of BLDC motor performances and its applications.
C314.5	Describe the knowledge about the Construction, principle of operation and performance of permanent magnet synchronous motors

<b>EE8661-Power Electronics and Drives Laboratory (C315)</b>	
C315.1	Understand the various characteristics of SCR, TRIAC, MOSFET and IGBT
C315.2	Analyze the AC to DC converter circuits
C315.3	Design and analyze the AC to AC converters
C315.4	Simulate the various power electronics circuits using simulation software
C315.5	Perform the speed control of machines using various power electronic circuits

<b>EE8681-Microprocessors and Microcontrollers Laboratory (C316)</b>	
C316.1	Understand and apply computing platform and software for engineering problems.
C316.2	Programming logics for code conversion.
C316.3	Acquire knowledge on A/D and D/A.
C316.4	Understand basics of serial communication.
C316.5	Understand and impart knowledge in DC and AC motor interfacing.

<b>EE8611-Mini Project (C317)</b>	
C317.1	Identify the real world problems of electrical engineering.
C317.2	Understand the working of various models in the electrical engineering systems.
C317.3	Apply the principles of electrical engineering in the real world systems.
C317.4	Criticize and experiment to arrive at solution for the electrical engineering problems.
C317.5	Explain the solution by effective presentation and involved active member in the team leads to lifelong learning.