DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

CRITERION 2

Course Outcomes and Program Outcomes

BATCH
2020-2024

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COURSE CODE
&
COURSE TITLE

(REGULATION 2017)

1. Course Code and Title

As per Anna University Regulation 2017, the list of courses for the batch 2020 -2024 is given in the Table 1.

Table 1 - List of Courses with Course Code:

S. No	COURSE CODE	COURSE CODE (AU)	COURSE NAME
Semester I			
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
Semester II			
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

S. No	COURSE CODE	COURSE CODE (AU)	COURSE NAME
Semester III			
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
Semester IV			
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
33.	C217	EE8412	TECHNICAL SEMINAR

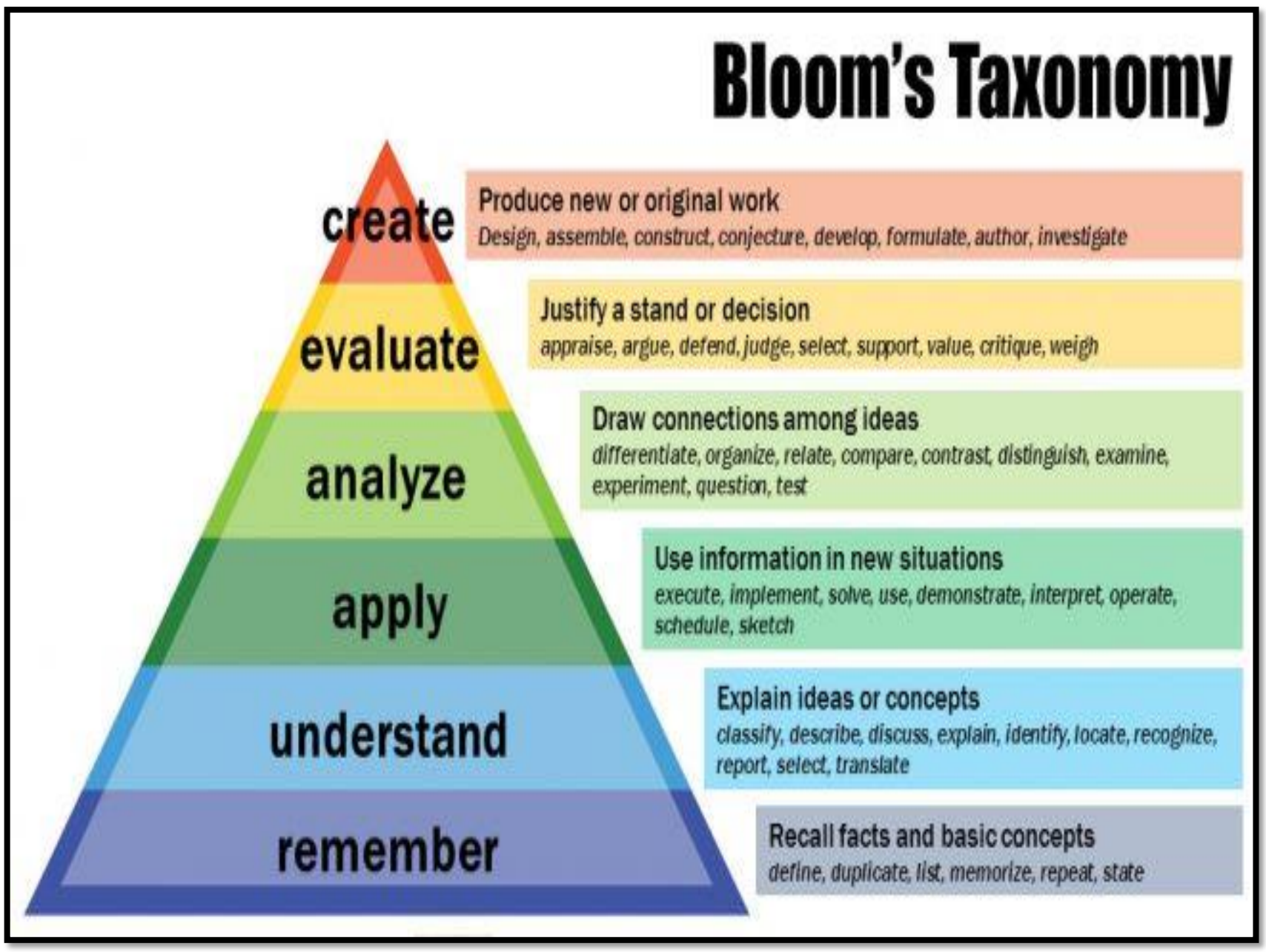
S. No	Course Code	Course Code (AU)	Course Name
Semester V			
34.	C301	EE8501	POWER SYSTEM ANALYSIS
35.	C302	EE8551	MICROPROCESSORS AND MICROCONTROLLERS
36.	C303	EE8552	POWER ELECTRONICS
37.	C304	EE8591	DIGITAL SIGNAL PROCESSING
38.	C305	CS8392	OBJECT ORIENTED PROGRAMMING
39.	C306	OMD551	BASICS OF BIOMEDICAL INSTRUMENTATION
40.	C307	EE8511	CONTROL AND INSTRUMENTATION LABORATORY
41.	C308	HS8581	PROFESSIONAL COMMUNICATION
42.	C309	CS8383	OBJECT ORIENTED PROGRAMMING LABORATORY
Semester VI			
43.	C310	EE8601	SOLID STATE DRIVES
44.	C311	EE8602	PROTECTION AND SWITCHGEAR
45.	C312	EE8691	EMBEDDED SYSTEMS
46.	C313	SB8029	NAAN MUDHALVAN
47.	C314	EE8005	SPECIAL ELECTRICAL MACHINES
48.	C315	EE8661	POWER ELECTRONICS AND DRIVES LABORATORY
49.	C316	EE8681	MICROPROCESSORS AND MICROCONTROLLERS LABORATORY
50.	C317	EE8611	MINI PROJECT

S. No	COURSE CODE	COURSE CODE (AU)	COURSE NAME
Semester VII			
51.	C401	EE8701	HIGH VOLTAGE ENGINEERING
52.	C402	EE8702	POWER SYSTEM OPERATION AND CONTROL
53.	C403	EE8703	RENEWABLE ENERGY SYSTEMS
54.	C404	OML751	TESTING OF MATERIALS
55.	C405	EI8075	FIBRE OPTICS AND LASER INSTRUMENTATION
56.	C406	SB8059	NAAN MUDHALVAN
57.	C407	EE8711	POWER SYSTEM SIMULATION LABORATORY
58.	C408	EE8712	RENEWABLE ENERGY SYSTEMS LABORATORY
Semester VIII			
59.	C409	MG8591	PRINCIPLES OF MANAGEMENT
60.	C410	EE8019	SMART GRID
61.	C411	EE8811	PROJECT WORK

BLOOMS TAXONOMY

According to revised Bloom's taxonomy, the levels in the cognitive domain are as follows:

Level	Descriptor	Level of Attainment
1	Remember	Recalling from the memory of the previously learned material
2	Understand	Explaining ideas or concepts
3	Apply	Using the information in another familiar situation
4	Analyze	Breaking information into the part to explore understandings and relationships
5	Evaluate	Justifying a decision or course of action
6	Create	Generating new ideas, products or new ways of viewing things



Bloom's taxonomy is hierarchical, meaning that learning at the higher level requires that skills at a lower level are attained.

COURSE OUTCOMES WITH K – LEVEL MAPPING FOR ALL COURSES (REGULATION – 2017)

SEMESTER - I

COURSE CODE & NAME : C101 & COMMUNICATIVE ENGLISH		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C101.1	**Enhance** their reading and technical writing skills in the first year itself	K2
C101.2	**Comfortably** read and understand articles in science and Engineering journals and articles in dailies	K2
C101.3	Get themselves **involved** in an active manner during informal conversations, state opinions and express willingness	K3
C101.4	**Communicate** effectively in short conversations and talks uttered in English	K4
C101.5	**Draft** essays related to their subjects and write personal letters and emails in comfortable manner for lifelong learning	K4

COURSE CODE & NAME : C102 & ENGINEERING MATHEMATICS – I		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C102.1	**Analyze** and apply the Engineering knowledge in differentiation to solve maxima and minima problems.	K4
C102.2	**Solve** the problems of integrals using different methods of calculus.	K5
C102.3	**Design** and **develop** the problems of integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.	K6
C102.4	**Analyze** the problems of integrals by using various methods of integration, such as substitution, partial fractions and integration by parts.	K4
C102.5	**Apply** various tools in solving the differential equations to recognize the need for life-long learning.	K3

COURSE CODE & NAME : C103 & ENGINEERING PHYSICS		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C103.1	**Analyse** the problems in columns and beams and gain the engineering knowledge in properties of matter to formulate.	**K4**
C103.2	**Understand** the fundamental concepts and applications of waves, lasers and fiber optics to give theoretical approaches to design modern devices.	**K2**
C103.3	**Interpret** the knowledge in thermal properties of materials and can determined expansion joints and heat exchangers in devices.	**K3**
C103.4	**Understand** the fundamental concepts of quantum theory and how modern electron microscope techniques use it to make predictions in the field of physics.	**K2**
C103.5	**Describe** the behaviour of solids, describe the fundamentals of crystals, their structures, and the various crystal development processes.	**K2**

COURSE CODE & NAME : C104 & ENGINEERING CHEMISTRY		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C104.1	**Apply** the water treatment techniques water in the industries and domestic water using the latest techniques by using engineering knowledge.	K3
C104.2	**Understand** the adsorption methods used in the field of water and air pollution purification to assess societal, health, safety and cultural issues in the environmental.	K2
C104.3	**Know** the significance of alloying and the behaviour of one component and two component systems using phase diagram and apply appropriate techniques in the field of metallurgy.	K2
C104.4	**Discuss** the types of fuels, calorific value calculations, and analyze the need for alternative fuels to solve current social problems by using engineering techniques.	K4
C104.5	**Review** the principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells with appropriate consideration for the societal and environmental considerations.	K2

COURSE CODE & NAME : C105 & PROBLEM SOLVING AND PYTHON PROGRAMMING		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C105.1	**Understand** the concepts of computational thinking and algorithmic problem-solving techniques	**K2**
C105.2	**Develop** simple python programs for applying the concepts of data types, expressions, and python statements	**K3**
C105.3	**Develop** Python programs for solving real-time computational problems by using conditionals, looping, functions, and strings.	**K3**
C105.4	**Understand** the concepts of compound data using Python lists, tuples, and dictionaries	**K2**
C105.5	**Develop** python programs for solving computational problems by using modules, files, and python packages	**K3**

COURSE CODE & NAME : C106 & ENGINEERING GRAPHICS		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C106.1	**Sketch** the conic sections, special curves, and draw orthographic views from pictorial views and models.	**K4**
C106.2	**Apply** the principles of orthographic projections of points in all quadrants, lines and planes in first quadrant.	**K3**
C106.3	**Sketch** the projections of simple solids like prisms, pyramids, cylinder and cone and obtain the traces of plane figures.	**K4**
C106.4	**Practice** the sectional views of solids like cube, prisms, pyramids, cylinders & cones and extend its lateral surfaces	**K3**
C106.5	**Sketch** the perspective projection of simple solids, truncated prisms, pyramids, cone and cylinders and sketch the isometric projection of simple machine parts.	**K4**

COURSE CODE & NAME : C107 & PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C107.1	**Develop** simple python programs for applying the concepts of data types, expressions, and python statements	**K3**
C107.2	**Develop** Python programs using conditionals, looping, functions, and strings for solving real-time computational problems.	**K3**
C107.3	**Understand** the concepts of compound data using Python lists, tuples, and dictionaries	**K2**
C107.4	**Develop** python programs for solving problems by using modules, files, and python packages	**K3**
C107.5	**Utilize** Python packages for developing real-world software applications	**K6**

COURSE CODE & NAME : C108 & PHYSICS AND CHEMISTRY LABORATORY		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C108.1	**Manipulate** the fundamental concepts like torque, elasticity and bending moment of beams for various engineering applications by the determination of rigidity modulus of the wire and young's modulus of the material of the beam by non-uniform bending.	**K3**
C108.2	**Practice** the fundamentals of thermal properties of material of the bad conductor by Lee's disc method.	**K3**
C108.3	**Understand** the basic knowledge and estimation of DO content in water sample by Winkler's method and molecular weight of polymer by Ostwald viscometer	**K2**
C108.4	**Dramatize** the strength of an acid using pH meter and conduct meter for applications in the field of engineering.	**K3**
C108.5	**Experimenting** the estimation of total, permanent and temporary hardness of water for our environment,	**K3**

SEMESTER - II

COURSE CODE & NAME : C109 & TECHNICAL ENGLISH		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C109.1	**Read and write** their technical and area-specific texts in an effortless manner	**K3**
C109.2	**Listen** comfortably and respond confidently to lectures and talks pertaining to their domain skills	**K2**
C109.3	**Speak** in an appropriate manner in both formal and informal situations for lifelong learning	**K3**
C109.4	**Create** CVs and draft Job applications in confident manner	**K6**
C109.5	**Communicate** confidently by using all the four skills with their peers and in real life situations	**K4**

COURSE CODE & NAME : C110 & ENGINEERING MATHEMATICS - II		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C110.1	**Analyze** the different types of matrices for solving practical problems.	**K4**
C110.2	**Apply** Gradient, divergence and curl of a vector point function and related identities in engineering field.	**K3**
C110.3	**Acquire** the knowledge to solve the engineering problems in analytic functions	**K2**
C110.4	**Analyze** and **apply** the different methods to solve complex integration problems.	**K4**
C110.5	**Create** and manage the projects after applying and analysing the fundamentals of Laplace transforms	**K6**

COURSE CODE & NAME : C111 & PHYSICS FOR ELECTRONICS ENGINEERING		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C111.1	**Comprehend** the materials for their diverse applications, it is necessary to grasp the energy band structures and the classical and quantum electron theories.	**K3**
C111.2	**Provide** a balanced understanding of diverse semiconductor electronic devices, such as hall devices, ohmic contacts, schottky diodes, and power transistors, by explaining the fundamental principles of semiconductor physics.	**K2**
C111.3	**Interpret** the properties of magnetic and dielectric materials, manipulate them and then analyze them for the purposes for which they are used in modern devices.	**K3**
C111.4	**Understand** the fundamental properties of optical materials in optoelectronics which is essential to comprehend the theoretical methods for designing modern optoelectronic devices.	**K2**
C111.5	**Comprehend** the fundamentals of quantum structures and the Nano scale manipulation of modern materials in spintronics and carbon electronics.	**K2**

COURSE CODE & NAME : C112 & BASIC CIVIL AND MECHANICAL ENGINEERING		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C112.1	**Appreciate** the Civil and Mechanical Engineering components of Projects	K2
C112.2	**Measure** distances and area by surveying	K3
C112.3	**Explain** the usage of construction material and proper selection of construction materials.	K3
C112.4	**Identify** the components used in power plant cycle, demonstrate working principles of petrol and diesel engine.	K2
C112.5	**Elaborate** the components of refrigeration and Air conditioning cycle.	K2

COURSE CODE & NAME : C113 & CIRCUIT THEORY		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C113.1	**Apply** Kirchhoff's current and voltage laws to simple circuits and Solve complex circuits using Mesh & Nodal Methods.	K3
C113.2	**Apply** Network theorems to linear circuits and to solve simple and complex problems.	K3
C113.3	**Analyze** the Transient response of RLC circuits under DC and AC excitation using Laplace Transform	K4
C113.4	**Analyze** three phase balanced and unbalanced star, delta network	K4
C113.5	**Compute** the frequency response of Series and Parallel resonance and analyze tuned circuits.	K2

COURSE CODE & NAME : C114 & ENVIRONMENTAL SCIENCE AND ENGINEERING		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C114.1	**Apply** the finding and implementing scientific, technological, economic and political solutions to environmental problems with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.	K3
C114.2	**Understand** the impact of the professional engineering solutions in societal and environmental contexts for the importance of public participation in conservation of natural resources.	K2
C114.3	**Discuss** the types of natural energy sources and analyze the need for alternative fuels to solve current social problems by using engineering techniques.	K2
C114.4	**Learning** the concepts from unsustainable to sustainable development and urban problems related to energy, water conservation, rain water harvesting.	K2
C114.5	**Apply** the basics of information technology in environment and human health function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.	K3

COURSE CODE & NAME : C115 & ENGINEERING PRACTICES LABORATORY		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C115.1	**Fabricate** carpentry joints	K6
C115.2	**Use** Welding equipment's to join the structures	K3
C115.3	**Perform** sheet metal works	K6
C115.4	**Perform** basic fitting operations and plumbing	K3
C115.5	**Carry out** basic home electrical works and appliances.	K3

COURSE CODE & NAME : C116 & ELECTRIC CIRCUITS LABORATORY		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C116.1	**Solve** the circuit problems using laws and theorem concepts.	K6
C116.2	**Simulate** electrical circuits and to experimentally verify various theorems for circuit designing purposes.	K5
C116.3	**Experiment** the frequency response and transients in passive elements.	K4
C116.4	**Simulate** the resonance circuits for several applications such as designing of tuning circuit, signal processing and voltage magnification.	K5
C116.5	Make the **simulation** of three phase circuits using suitable simulation for both balanced and unbalanced condition.	K6

SEMESTER - III

COURSE CODE & NAME : C201 & TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C201.1	**Understand** to solve the given standard partial differential equations.	K2
C201.2	**Identify** and analyze the differential equations using Fourier series analysis in engineering applications.	K4
C201.3	**Create** using modern techniques of Fourier series to solve one- and two-dimensional heat flow problems and one-dimensional wave equations.	K5
C201.4	A**pply** the engineering knowledge to manage the projects in transforms and partial differential equations to formulate and solve some of the physical engineering problems.	K6
C201.5	**Use** the effective modern mathematical tools to solve the partial differential equations by using Z transform techniques for discrete time systems.	K3

COURSE CODE & NAME : C202 & DIGITAL LOGIC CIRCUITS		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C202.1	**Understand** the various number systems and study the characteristics of the digital logic family circuits	K2
C202.2	**Apply** the Boolean functions, K maps and implementation of combinational logic circuits.	K3
C202.3	**Analyze** the various synchronous and asynchronous sequential circuits.	K4
C202.4	**Implement** Boolean logic equations with Programmable logic Devices	K3
C202.5	**Develop** VHDL code for combinational and Sequential Logic Circuits	K3

COURSE CODE & NAME : C203 & ELECTROMAGNETIC THEORY		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C203.1	**Comprehend** the basic mathematical concepts related to vector calculus, coordinate system, Gauss's law and applications.	K2
C203.2	**Realize** the concepts of electrical potential and apply the boundary conditions and their application	K3
C203.3	**Develop** the concepts of magneto statics and apply the boundary conditions and their application.	K3
C203.4	**Understand** the concepts of Faradays law, induced emf and Maxwell's equations to study the electrodynamics fields.	K2
C203.5	**Examine** the basic fundamental concepts of electromagnetic waves, parameters and systems.	K4

COURSE CODE & NAME : C204 & ELECTRICAL MACHINES – I		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C204.1	**Comprehend** the fundamental laws in the magnetic circuits and its performance for all electrical machines.	K2
C204.2	**Explore** the equivalent circuit of transformers at different loading condition and apply the voltage regulation and efficiency	K3
C204.3	**Interpret** the electric and magnetic field interactions in electromechanical devices and machines	K2
C204.4	**Understand** the DC machines based on their type of excitation	K2
C204.5	**Acquire** the type of speed control of DC motor in different application	K3

COURSE CODE & NAME : C205 & ELECTRON DEVICES AND CIRCUITS		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C205.1	**Explain** the basic structure and operation of basic electronic devices such and its characteristics.	K2
C205.2	**Illustrate** the basic function and working of various electronic devices such as transistors and thyristors.	K2
C205.3	**Choose** the various modes of operation in gain and frequency response and small signal amplifier circuits	K2
C205.4	**Perform** the different stages of amplifier, differential amplifier cascade amplifier and power amplifier	K2
C205.5	**Understand** the parameters of feedback amplifiers and oscillator circuits.	K2

COURSE CODE & NAME : C206 & POWER PLANT ENGINEERING		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C206.1	**Describe** the modern coal-based power plant and components used in thermal plant.	K2
C206.2	**Explain** the fundamental of various cycles and diesel, gas and combined cycle power plant.	K2
C206.3	**Discuss** the layout and working of various Nuclear Power Plants	K2
C206.4	**Understand** the construction and working of hydroelectric and various non-conventional power plants.	K2
C206.5	**Analyze** energy, economic and environmental issues of power plant.	K4

COURSE CODE & NAME : C207 & ELECTRONICS LABORATORY		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C207.1	**Understand** the fundamental operation and characteristics of semiconductor devices.	K2
C207.2	**Formulate** the basic parameters of semiconductor devices and their limiting factors.	K3
C207.3	**Apply** the BJT amplifiers in various configuration techniques.	K3
C207.4	**Design** the frequency response characteristics of amplifiers	K4
C207.5	**Design** the basic electronic circuits with application to diodes, field-effect transistors and bipolar junction transistors.	K4

COURSE CODE & NAME : C208 & ELECTRICAL MACHINES LABORATORY – I		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C208.1	**Analyze** the performance of various D.C. Generators and understand its applications.	K4
C208.2	**Analyze** the operation of D.C. Generators and D.C motor on no load and load condition.	K4
C208.3	**Analyze** the performance characteristics of various D.C. Motors and understand its applications.	K4
C208.4	**Analyze** the performance of DC motor by conducting suitable tests	K4
C208.5	**Evaluate** the voltage regulation and predetermine the performance of the single phase and three phase transformers.	K5

SEMESTER - IV

COURSE CODE & NAME : C209 & NUMERICAL METHODS		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C209.1	**To apply** the fundamental techniques of solving algebraic and transcendental equations.	**K4**
C209.2	**To apply** the numerical techniques of interpolation and error approximations in various intervals in real life situations.	**K3**
C209.3	**To apply** the engineering knowledge to solve the differentiation and integration problems.	**K3**
C209.4	**To identify** and **apply** the modern tools for solving first and second order ordinary differential equations.	**K4**
C209.5	**To identify** the problem and solve the partial and ordinary differential equations with initial and boundary conditions by using modern tools for project management.	**K6**

COURSE CODE & NAME : C210 & ELECTRICAL MACHINES – II		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C210.1	**Analyze** the performance of salient and non-salient pole synchronous generator of construction, working principle.	K4
C210.2	**Understand** the concept, principle and the performance of synchronous motor.	K4
C210.3	**Illustrate** the construction, working principle and performance of three phase induction motor and its types.	K2
C210.4	**Analyze** the different types of starters and speed control methods of three phase induction motor.	K4
C210.5	**Understand** the construction, principle and **analyze** the performance of single-phase induction motors and special electrical machines.	K4

COURSE CODE & NAME : C211 & TRANSMISSION AND DISTRIBUTION		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C211.1	**Design** the transmission line parameters for specific performance and estimate the voltage drop.	K4
C211.2	**Design** equivalent circuits for the transmission lines based on distance and to calculate the voltage regulation and efficiency for public safety.	K3
C211.3	**Analyze** the **design** of transmission lines insulator rings and to improve the efficiency.	K4
C211.4	**Explain** the types of cables and the methods of grading of cables	K3
C211.5	**Describe** the distribution systems, substations, groundings, fundamentals of EHVAC, HVDC and FACTS systems.	K3

COURSE CODE & NAME : C212 & MEASUREMENTS AND INSTRUMENTATION		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C212.1	**Acquire** the basic knowledge on functional elements of instruments and errors in measurement system.	K2
C212.2	**Explain** the suitable instrument for measuring electrical and electronics parameters.	K2
C212.3	**Apply** a suitable bridge circuit used for measuring different electrical quantities.	K3
C212.4	**Understand** the construction, operating principles of different storage and display devices.	K2
C212.5	**Apply** the concepts and operational features of transducer and Data Acquisition System.	K3

COURSE CODE & NAME : C213 & LINEAR INTEGRATED CIRCUITS AND APPLICATIONS		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C213.1	Know the **fundamental** knowledge in IC fabrication procedure.	K2
C213.2	**Understand** the characteristics of op-amps and signal analysis using op-amp.	K2
C213.3	**Understand** the importance of signal analysis and applications of op-amp based circuits.	K2
C213.4	**Understand** the functional blocks and the applications of special ICs like timers, PLL circuits	K2
C213.5	**Understand** the operation of application ICs like voltage regulator and switching regulator.	K2

COURSE CODE & NAME : C214 & CONTROL SYSTEMS		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C214.1	**Apply** the transfer function models for analysis of physical system and control system components.	K3
C214.2	**Analyze** the time response of various linear systems and steady state errors.	K4
C214.3	**Apply** the frequency response of the system in open and closed loop response.	K3
C214.4	**Apply** the concepts of system stability to analyze performance of closed loop systems.	K3
C214.5	**Apply** the basic concepts of state variable analysis of systems and effect of state feedback of system	K3

COURSE CODE & NAME : C215 & ELECTRICAL MACHINES LABORATORY - II		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C215.1	**Analyze** the regulation of Alternators by EMF, MMF and ZPF Methods	K4
C215.2	**Analyze** the Characteristics of synchronous motor using V and inverted V curve	K4
C215.3	**Analyze** the separation of losses in Induction Motor	K4
C215.4	**Analyze** the efficiency and performance characteristics of single phase induction motor	K4
C215.5	**Analyze** the efficiency and performance characteristics of three phase induction motor	K4

COURSE CODE & NAME : C216 & LINEAR AND DIGITAL INTEGRATED CIRCUITS LABORATORY		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C216.1	**Evaluate** the boolean functions and develop adder, subtractor circuits	K5
C216.2	**Analyze** the various code converters to understand the importance of code conversion.	K4
C216.3	**Analyze** and implement 4-bit Shift Registers	K4
C216.4	**Develop** Op-Amp in various application circuits	K3
C216.5	**Formulate** the counters using specific counter IC.	K2

COURSE CODE & NAME : C217 & TECHNICAL SEMINAR		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C217.1	**Understand** the effective and recent advancement presentation on Engineering & technology	K2
C217.2	**Apply** and prepare the State-of-art technologies in the present-day technological growths.	K3
C217.3	**Formulate** the presentation using the concepts of ordering and determining the central, main and supporting ideas	K2
C217.4	**Present** any topic in any recent advancement with good communicative skill infront of peers and faculty members	K3
C217.5	**Perform** well in placement recruitment drive with good technical skills and communication skills	K2

SEMESTER - V

COURSE CODE & NAME : C301 & POWER SYSTEM ANALYSIS		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C301.1	**Classify** the power system components and per unit values under steady state operating condition.	K2
C301.2	**Apply** the power flow solution for power system problem by GS and NR techniques.	K3
C301.3	**Apply** the Thevenin's theorem and bus impedance matrix for power system under symmetrical fault conditions.	K3
C301.4	**Analyze** the power system network under L-L and L-L-G fault condition using symmetrical components.	K4
C301.5	**Analyze** the power system stability using equal area criterion and to modified Euler's methods to solve the swing equation	K4

COURSE CODE & NAME : C302 & MICROPROCESSORS AND MICROCONTROLLERS		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C302.1	**Describe** the architecture and working of 8085 with timing diagram.	K2
C302.2	**Describe** and implement the different instructions using addressing modes.	K2
C302.3	**Understand** the architecture and working of various blocks with timing diagram in 8081 microcontrollers.	K2
C302.4	**Understand** the various peripherals interfaced with 8085 microprocessors.	K2
C302.5	**Apply** the basic knowledge of microcontroller programming and its different applications.	K3

COURSE CODE & NAME : C303 & POWER ELECTRONICS		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C303.1	**Describe** the types of semiconductor devices and their switching characteristics.	K2
C303.2	**Analyze** the various AC to DC converters.	K4
C303.3	**Sketch** the fundamental switching topologies of DC-to-DC converters and their applications.	K3
C303.4	**Interpret** the modulation and harmonic reduction techniques in DC to AC Converters.	K3
C303.5	**Illustrate** the operation of AC voltage controller and to implement cyclo converter design for their applications.	K2

COURSE CODE & NAME : C304 & DIGITAL SIGNAL PROCESSING		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C304.1	**Analyze** the various types of signal and systems, sampling in time signal.	K4
C304.2	**Understand** and **apply** discrete time Linear Time Invariant systems using Z transform and Discrete Time Fourier Transform.	K3
C304.3	**Apply** the concepts of Discrete Fourier Transform and Fast Fourier Transform to solve Problems	K3
C304.4	**Apply** Finite impulse response and Infinite impulse response digital filters.	K3
C304.5	**Understand** the various types of architecture of digital signal processors.	K2

COURSE CODE & NAME : C305 & OBJECT ORIENTED PROGRAMMING		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C305.1	**Design** and implement java simple application that make use of classes, packages and interfaces	K2
C305.2	**Develop** a java application using class and its members and also implement java converter applications.	K4
C305.3	**Apply** the java string programs using string operations using array list, abstract classes	K4
C305.4	**Develop** a java program to implement user defined exceptions, reading and writing a file	K4
C305.5	**Develop** a java program for multi-threaded applications and generic function.	K4

COURSE CODE & NAME : C306 & BASICS OF BIOMEDICAL INSTRUMENTATION		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C306.1	**Learn** the different bio potential and its propagation.	K2
C306.2	**Familiarize** the different electrode placement for various physiological recording	K3
C306.3	**Design** bio amplifier for various physiological recording	K4
C306.4	**Understand** various technique non electrical physiological measurements	K2
C306.5	**Understand** the different biochemical measurements	K2

COURSE CODE & NAME : C307 & CONTROL AND INSTRUMENTATION LABORATORY		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C307.1	**Analyze** the characteristics of P, PI and PID controllers experimentally and analyze the stability of the control system using MATLAB	K4
C307.2	**Analyze** the various types of ADC, DAC converters.	K4
C307.3	**Analyze** the response of lag, lead and lag-lead compensators.	K4
C307.4	**Analyze** the basics of bridge networks and signal conditioning circuits.	K4
C307.5	**Analyze** the response and stability of control systems using simulation package.	K4

COURSE CODE & NAME : C308 & PROFESSIONAL COMMUNICATION		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C308.1	**Enhance** the employability and career skills in engineering domain	**K3**
C308.2	**Improve** professional communication	**K4**
C308.3	**Build** confidence in employability skills	**K4**
C308.4	**Face** interviews with necessary skills	**K5**
C308.5	**Acquire** required skills to excel in their career	**K3**

COURSE CODE & NAME : C309 & OBJECT ORIENTED PROGRAMMING LABORATORY		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C309.1	**Design** and implement java simple application that make use of classes, packages and interfaces	K2
C309.2	**Develop** a java application using class and its members and also implement java converter applications.	K4
C309.3	**Apply** the java string programs using string operations using array list, abstract classes	K4
C309.4	**Develop** a java program to implement user defined exceptions, reading and writing a file	K4
C309.5	**Develop** a java program for multi-threaded applications and generic function.	K4

SEMESTER - VI

COURSE CODE & NAME : C310 & SOLID STATE DRIVES		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C310.1	**Explain** the fundamental of steady state and dynamics of a drive system.	K2
C310.2	**Illustrate** the operation of the converter / chopper fed dc drive to solve simple problems	K3
C310.3	**Demonstrate** the operation of classical and modern induction motor drives	K3
C310.4	**Analyze** the operation and performance of synchronous motor drives.	K4
C310.5	**Design** the current and speed controllers for a closed loop solid-state DC motor drive.	K3

COURSE CODE & NAME : C311 & PROTECTION AND SWITCHGEAR		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C311.1	**Comprehend** the fundamental knowledge on various faults and protective schemes in power system.	K2
C311.2	**Assimilate** the various electromagnetic relays and its application	K2
C311.3	**Choose** the protection scheme for various faults in motor, generator, transformer, bus bar, transmission line	K2
C311.4	**Know** the various static relays and numerical relays and its application	K2
C311.5	**Understand** the concepts and principle of various circuit breakers	K2

COURSE CODE & NAME : C312 & EMBEDDED SYSTEMS		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C312.1	**Explain** the building process and hardware, software tools in embedded systems.	K2
C312.2	**Analyze** the types if I/O device ports, bus and relate processor in embedded system.	K4
C312.3	**Apply** the embedded development strategies to develop the embedded firmware environment.	K3
C312.4	**Comprehend** the fundamental concepts of various techniques in Real Time Operating System.	K2
C312.5	**Apply** the knowledge of concepts of embedded system for various applications such as economic, environmental and society.	K3

COURSE CODE & NAME : C313 & MODERN POWER CONVERTERS		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C313.1	**Understand** the concepts of Switched mode DC power supplies.	K2
C313.2	**Know** the operation of phase Controlled Rectifiers and apply the inverters and essentiality of harmonic control in power electronic circuits.	K3
C313.3	**Apply** the AC-AC converters with and without DC link harmonic control in power electronic circuits.	K3
C313.4	**Understand** the concepts of ZVS, ZCS, Quasi resonant converters.	K2
C313.5	**Apply** the converters for AC-DC conversion and SMPS	K3

COURSE CODE & NAME : C314 & SPECIAL ELECTRICAL MACHINES		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C314.1	**Understand** the operation of synchronous reluctance motors and its characteristics.	K2
C314.2	**Describe** the construction, operation and methods of stepping motor	K2
C314.3	**Understand** the operation of switched reluctance motor and its characteristics.	K2
C314.4	**Illustrate** the construction, operation and performance characteristics of permanent magnet synchronous motors.	K2
C314.5	**Choose** the fundamental of PMSM and its power controllers.	K2

COURSE CODE & NAME : C315 & POWER ELECTRONICS AND DRIVES LABORATORY		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C315.1	**Demonstrate** the gate pulse generation using various configurations.	K2
C315.2	**Analyze** the characteristics of SCR, TRIAC, MOSFET & IGBT.	K4
C315.3	**Analyze** the performance parameters of DC – AC, DC – DC converter circuits.	K4
C315.4	**Analyze** the performance of AC – DC, AC – AC converter circuits.	K4
C315.5	**Simulate** of various power electronic converter circuits.	K3

COURSE CODE & NAME : C316 & MICROPROCESSORS AND MICROCONTROLLERS LABORATORY		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C316.1	**Apply** the arithmetic operations, logic operations and sorting using 8085 microprocessors.	K3
C316.2	**Analyze** the program for ADC, DAC conversion, finding the maximum and minimum numbers in a series.	K4
C316.3	**Analyze** the operations of peripheral interfacing with 8085 microprocessors	K4
C316.4	**Apply** the arithmetic, logic operations and branching operation using 8051 microcontrollers	K3
C316.5	**Apply** the program for peripheral interfacing with 8051 microcontrollers.	K3

COURSE CODE & NAME : C317 & MINI PROJECT		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C317.1	**Apply** the fundamental knowledge within the technical area to a given problem, analyze previous researcher's work.	K3
C317.2	**Analyze** the engineering solutions to complex problems and conduct experiments.	K4
C317.3	**Apply** appropriate technology tools for communication, teamwork, conclusion support and attitudes of a professional engineer.	K3
C317.4	**Interact** with team members in a qualified manner, to ensure a collective project environment and also apply a strong working knowledge of ethics.	K3
C317.5	**Document** and present one's own work for a given target group with good oral and written presentation skills and also recognize the need for life-long learning by undergoing the project work	K3

SEMESTER - VII

COURSE CODE & NAME : C401 & HIGH VOLTAGE ENGINEERING		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C401.1	**Understand** the overvoltage causes, effects & protection in power system.	K2
C401.2	**Describe** the various dielectric breakdown mechanism	K2
C401.3	**Understand** the various types of generating for HVAC and HVDC.	K2
C401.4	**Explore** the different overvoltage AC and DC measuring at appropriate method	K2
C401.5	**Apply** the fundamental of test for transformer, insulator, CB and electrical apparatus.	K3

COURSE CODE & NAME : C402 & POWER SYSTEM OPERATION AND CONTROL		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C402.1	**Apply** the fundamental structure and operation of power system	K3
C402.2	**Apply** the power frequency controller design for single and two area system.	K3
C402.3	**Analyze** the reactive power control and maintain the voltage profile for varying the load.	K4
C402.4	**Analyze** and **apply** the unit commitment and economic dispatch problem.	K4
C402.5	**Understand** the computer control and its real time applications.	K2

COURSE CODE & NAME : C403 & RENEWABLE ENERGY SYSTEMS		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C403.1	**Explain** the environment aspect, awareness and to get acceptable inputs about renewable Energy resources and technologies.	K2
C403.2	**Describe** the working of various types of wind energy conversion system.	K2
C403.3	**Discuss** the solar energy conversion system and different types of solar plants system.	K2
C403.4	**Understand** the basic of energy conversion system like Hydro, biomass and Geothermal power plants.	K2
C403.5	**Explain** the basic of various renewable energy resources and technologies and their applications.	K2

COURSE CODE & NAME : C404 & TESTING OF MATERIALS		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C404.1	**Learn** about different type of materials, classification and Testing Standards.	K2
C404.2	**Analyze** engineering components using various mechanical testing procedure.	K4
C404.3	**Describe** about Principles, Techniques, Advantages and Limitations, Applications of Non-Destructive Testing.	K2
C404.4	**Exploit** Principles, Types, Advantages and Limitations, Applications of materials characterization process.	K4
C404.5	**Compare** the types of Thermal testing and contrast the chemical testing of materials	K4

COURSE CODE & NAME : C405 & FIBRE OPTICS AND LASER INSTRUMENTATION		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C405.1	**Understand** the principle, attenuation characteristics of optical fibers.	K2
C405.2	**Describe** the knowledge of optical fibres and its industrial applications.	K2
C405.3	**Classify** the principle, operation and characteristics of various types of lasers.	K2
C405.4	**Apply** the appropriate theory and specific industrial application of laser.	K3
C405.5	**Discuss** the fundamental of hologram and its medical applications.	K3

COURSE CODE & NAME : C406 & POWER SYSTEMS TRANSIENTS		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C406.1	**Comprehend** the importance of transients and its effect on power system.	K2
C406.2	**Understand** the overvoltage due to switching transients.	K2
C406.3	**Discuss** the importance of lighting transients and its interaction with power system.	K2
C406.4	**Understand** the traveling waves concepts in transmission line.	K2
C406.5	**Comprehend** the integrated power system using qualitative application of EMTP for transient computation.	K2

COURSE CODE & NAME : C407 & POWER SYSTEM SIMULATION LABORATORY		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C407.1	**Analyze** the appropriate program for transmission line parameters and its performance	K4
C407.2	**Formulate** the bus admittance and impedance matrices and derive the solution for electrical network problems	K5
C407.3	**Analyze** the fault analysis for a given power system under symmetrical and unsymmetrical fault.	K4
C407.4	**Analyze** the stability of the power system by simulation using appropriate techniques	K4
C407.5	**Formulate** a suitable program to solve economic dispatch problem and load frequency dynamics of interconnected power system.	K5

COURSE CODE & NAME : C408 & RENEWABLE ENERGY SYSTEMS LABORATORY		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C408.1	**Analyze** the concept of renewable energy resources and technologies.	K4
C408.2	**Analyze** the characteristics of solar PV and wind energy system	K4
C408.3	**Evaluate** the performance of micro wind generation and Hybrid systems.	K5
C408.4	**Analyze** the simulation technique in solar PV system, wind and hybrid energy systems.	K4
C408.5	**Analyze** the importance of intelligent controllers for hybrid energy generation systems.	K4

SEMESTER - VIII

COURSE CODE & NAME : C409 & PRINCIPLES OF MANAGEMENT		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C409.1	Understand the definition of management, evolution of management, types of business organization and role of managers in a business entity.	K2
C409.2	Know and understand the planning strategy, setting an objective oriented planning, tools and techniques applied for planning and decision	K2
C409.3	Understand the organization structure, roles, delegation of authority. Understand the human resource planning, recruitment process, training and development.	K2
C409.4	Understand the importance of directing workforce, motivation to employees, job enrichment, essentials of communication between entities of business	K2
C409.5	Understand and generate budget controls, productivity improvement and control framework for achieving the above objectives.	K3

COURSE CODE & NAME : C410 & SMART GRID		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C410.1	**Realize** the basic concepts of smart grid and latest developments.	K2
C410.2	**Apply** the several characteristics of the smart grid such as technologies, components, architectures and applications	K3
C410.3	**Apply** the appropriate knowledge about various smart meters and advanced metering infrastructure.	K3
C410.4	**Apply** the knowledge of power quality management in Smart Grids	K3
C410.5	**Apply** more understanding on LAN, WAN and Cloud Computing for Smart Grid applications	K3

COURSE CODE & NAME : C411 & PROJECT WORK		
Code	**Course Outcome** (On Successful completion of the course, Students will be able to)	**K- Level**
C411.1	**Develop** the ability to solve a specific problem right from its identification and literature review till the successful solution of the same.	K6
C411.2	**Analyze** a new method to solve the related problems	K4
C411.3	**Apply** the fundamental engineering knowledge & skills to solving the problem.	K3
C411.4	**Agree** and work as a team to come to a common conclusion	K5
C411.5	**Design** engineering solutions to complex problems in a systematic approach	K6

COURSE OUTCOMES AND POs & PSOs MAPPING WITH JUSTIFICATIONS

4. Course outcomes and POs & PSOs mapping with Justifications.

The mapping level contribution between CO-PO/PSOs is categorized as follows:

3: High 2: Medium 1: Low 0 -: No Correlation

COURSE CODE & NAME : C101 & COMMUNICATIVE ENGLISH														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C101.1	-	-	-	-	-	-	-	2	2	3	-	3	-	-
C101.2	-	-	-	-	-	-	-	-	2	3	-	3	-	-
C101.3	-	-	-	-	-	-	-	2	2	3	-	3	-	-
C101.4	-	-	-	-	-	-	-	2	3	3	-	3	-	-
C101.5	-	-	-	-	-	-	-	2	2	3	-	3	-	-
C101	-	-	-	-	-	-	-	2.00	2.20	3.00	-	3.00	-	-

Course Outcome Number	Mapped with POs	Justification
CO1	PO8 (Medium)	It enables to **fair** effectively integrate reading skills with other language skills for effective communication.
	PO9 (Medium)	It provides **fair** opportunity to involve in situation-based tasks demanding the application of ethical principles and practices, group discussions
	PO10 (High)	It helps to **strong** rearrange points, ensure use of appropriate vocabulary, proof read and edit paragraphs on interpretation of data.
	PO12 (High)	It helps to **strong** inculcate habitual reading by exposing to texts of different genres, thereby develop soft skills that are required to face challenges in life.
CO2	PO9 (Medium)	It **fair** helps students to rearrange points, ensure use of appropriate vocabulary, proof read and edit paragraphs and essays on topics related to environment and sustainability
	PO10 (High)	It enables to **strong** effectively integrate reading skills with other language skills for effective communication by reading posters on complex social, environmental, ethical and engineering problems by gathering primary and secondary data from newspapers, magazines, journals and Internet.

	PO12 (High)	It helps to **strong** inculcate habitual reading for effective communication by reading posters on complex social, environmental, ethical and engineering problems by gathering primary and secondary data from newspapers, magazines, journals and Internet that are required to face challenges in life.
CO3	PO8 (Medium)	It provides opportunity to involve **fair** in situation-based tasks demanding the application of ethical principles and practices, group discussions
	PO9 (Medium)	It provides opportunity to involve **fair** in situation-based tasks demanding the application of ethical principles and practices, group discussions
	PO10 (High)	It enables **strong** to communicate with clarity and precision using flawless language in written form.
	PO12 (High)	It helps to enhance **strongly** speaking skills in daily conversations in life.
CO4	PO8 (Medium)	It provides **fair** opportunity to involve in situation-based tasks demanding the application of ethical principles and practices, group discussions and tasks by actively listening to ask questions. Listening to different accents through audio-video lectures and also to respond to questions posed.
	PO9 (High)	It provides **fair** opportunity to involve in situation-based tasks demanding the application of ethical principles and practices, group discussions and tasks by actively listening to ask questions. Listening to different accents through audio-video lectures and also to respond to questions posed.
	PO10 (High)	It enables to **strong** effectively integrate speaking skills with other language skills for effective communication
	PO12 (High)	It enables the students **strong** to communicate to others in all situations.
CO5	PO8 (Medium)	It provides **fair** opportunity to create posters on complex social, environmental, ethical and engineering problems by gathering primary and secondary data from newspapers, magazines, journals and Internet. PO8 helps students to interpret data given in charts and write paragraphs by organizing ideas cohesively, coherently, logically.
	PO9 (Medium)	It helps students to organize **fair** ideas cohesively, coherently, logically while writing paragraphs and essays on topics related to environment and sustainability
	PO10 (High)	It enables to **strong** effectively integrate writing skills with other language skills for effective communication.
	PO12 (High)	It enables **strong** to delegate and assume responsibilities to gather data for doing collaborative tasks and ensures non-verbal communication through posters

COURSE CODE & NAME : C102 & ENGINEERING MATHEMATICS – I														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C102.1	**3**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**-**
C102.2	**3**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**-**
C102.3	**3**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**-**
C102.4	**3**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**-**
C102.5	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**-**
C102	**3.00**	**3.00**	**1.20**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.00**	**2.00**	**-**	**-**

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It involves **strong** knowledge in applying the Engineering knowledge in differentiation related to solve maxima and minima problems.
	PO2 (High)	It provides **strong** idea in analyzing the Engineering knowledge problems in differentiation related to solve maxima and minima problems.
	PO3 (Low)	It provides **basic** idea in designing the Engineering knowledge problems in differentiation related to solve maxima and minima problems.
	PO11 (Medium)	It provides **fair** knowledge of engineering and management principle to manage projects in multidisciplinary environments related to the concept of differentiation in solving maxima and minima problems.
	PO12 (Medium)	It implicates **fair** idea for preparing and to engage independent and life - long learning in the technological change related to the concept of differentiation in solving maxima and minima problems.
CO2	PO1 (High)	It involves **strong** knowledge in solving the problems of integrals using different methods related to calculus.
	PO2 (High)	It provides **strong** idea in analyzing and the solving the problems of integrals using different methods related to calculus.
	PO3 (Low)	It provides **basic** idea in designing and solving the problems of integrals using different methods related to calculus.
	PO11 (Medium)	It provides **fair** knowledge of engineering and management principle to manage projects in multidisciplinary environments related to solving the problems of integrals using different methods of calculus.

	PO12 (Medium)	It implicates **fair** idea for preparing and to engage independent and life - long learning in the technological change related to solving the problems of integrals using different methods of calculus.
CO3	PO1 (High)	It involves **strong** knowledge in designing and developing the problems of integration related to multiple integrals
	PO2 (High)	It provides **strong** idea in analyzing, designing and developing the problems of integration related to multiple integrals.
	PO3 (Low)	It provides **basic** idea in designing the solution to the problems of integration related to multiple integrals.
	PO11 (Medium)	It provides **fair** knowledge of engineering and management principle to manage projects in multidisciplinary environments related to designing and developing the problems of integration related to multiple integrals.
	PO12(Medium)	It implicates **fair** idea for preparing and to engage independent and life - long learning in the technological change related to designing and developing the problems of integration related to multiple integrals.
CO4	PO1 (High)	It involves **strong** knowledge in solving the problems of integrals related to using various methods of integration.
	PO2 (High)	It provides **strong** idea in analyzing the problems of integrals related to using various methods of integration.
	PO3 (Low)	It provides **basic** idea in designing and analyzing the problems of integrals related to using various methods of integration.
	PO11 (Medium)	It provides **fair** knowledge of engineering and management principle to manage projects in multidisciplinary environments related to analyzing the problems of integrals using various methods of integration.
	PO12 (Medium)	It implicates **fair** idea for preparing and to engage independent and life - long learning in the technological change related to analyzing the problems of integrals using various methods of integration.
CO5	PO1 (High)	It involves **strong** knowledge in applying various tools to recognize the need for life-long learning related to solving the differential equations.
	PO2 (High)	It provides **strong** idea in analyzing various tools to recognize the need for life-long learning related to solving the differential equations.
	PO3 (Medium)	It provides **fair** idea in designing various tools to recognize the need for life-long learning related to solving the differential equations.
	PO11 (Medium)	It provides **fair** knowledge of engineering and management principle to manage projects in multidisciplinary environments related to solving the differential equations.
	PO12 (Medium)	It implicates **fair** idea for preparing and to engage independent and life - long learning in the technological change related to solving the differential equations.

COURSE CODE & NAME : C103 & ENGINEERING PHYSICS														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C103.1	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
C103.2	**3**	**2**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
C103.3	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
C103.4	**2**	**2**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
C103.5	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
C103	**2.40**	**1.60**	**-**	**-**	**1.00**	**-**	**-**	**-**	**-**	**-**	**-**	**1.00**	**-**	**-**

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It involves **strong** theory in science and Physics related to identify requirements for the elasticity and its applications relevant to the field of engineering.
	PO2 (Medium)	It provides **fair** knowledge in the problems of columns and beams.
CO2	PO1 (High)	It involves **strong** theory in science and Physics concepts in types of laser and fiber optics.
	PO2 (Medium)	It provides **fair** knowledge on the waves and optical devices and their applications in fiber optics.
	PO5 (Low)	It involves **basic** idea in laser and fiber optics to applying modern engineering and communication fields.
	PO12 (Low)	It provides **basic** life-long learning in the broadest context of technological change.
CO3	PO1 (Medium)	It involves **fair** concepts in thermal properties of materials.
	PO2 (Low)	It provides **basic** in problems related to expansion joints and heat exchangers.
	PO12 (Low)	It provides **basic** ability to recognize the need of thermal energy related applications.

CO4	PO1 (Medium)	It furnishes **fair** in fundamental concepts of quantum theory.
	PO2 (Medium)	It involves **fair** in quantum concepts and problems in the case of particle in the box.
	PO5 (Low)	It involves **basic** in modern electron microscope techniques use it to make predictions in the field of physics.
C1O5	PO1 (Medium)	It furnishes **fai**r knowledge in the behavior of solids, describe the fundamentals of crystals, their structures, and the various crystal development processes.
	PO2 (Low)	It involves **basic** in the problems in crystal structure and different crystal growth techniques.

COURSE CODE & NAME : C104 & ENGINEERING CHEMISTRY														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C104.1	**2**	**1**	**2**	**-**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
C104.2	**2**	**1**	**-**	**-**	**2**	**1**	**1**	**-**	**-**	**1**	**-**	**-**	**-**	**-**
C104.3	**2**	**1**	**1**	**-**	**1**	**1**	**-**	**-**	**-**	**1**	**-**	**1**	**-**	**-**
C104.4	**2**	**1**	**-**	**-**	**2**	**2**	**-**	**-**	**-**	**2**	**-**	**1**	**-**	**-**
C104.5	**2**	**1**	**1**	**-**	**1**	**1**	**2**	**-**	**-**	**1**	**-**	**1**	**-**	**-**
C104	**2**	**1**	**1.67**	**-**	**1.40**	**1.60**	**1.50**	**-**	**-**	**1.25**	**-**	**1.00**	**-**	**-**

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (Medium)	It involves **fair** knowledge in chemistry related to various water purification techniques.
	PO2 (Low)	It provides **basic** idea in the water quality parameters and their analytic methods.
	PO3 (Medium)	It provides **fair** futuristic idea in finding solution to boiler design.
	PO5 (Low)	It describes the **basic** fundamental theories in water purification techniques
	PO6 (Medium)	It applies the **fair** contextual knowledge to address the issues of social, health and safety issues.
	PO12 (Low)	It provides **basic** idea in applying the processes related water quality parameters to everyday life.
CO2	PO1 (Medium)	It involves **fair** theory in surface chemistry and catalysis related to adsorption and enzymes.
	PO2 (Low)	It provides **basic** adsorption technique and theories of adsorption.

	PO5 (Medium)	It describes **fair** criteria for adsorption and catalysis types.
	PO6 (Low)	It involves **basic** theory for adsorption of gas on solid and catalytic poisons.
	PO7 (Low)	It provides **basic** applications in the pollution abatement both in air and water pollution.
	PO10 (Low)	It involves **basic** futuristic idea in finding solution both in air and water pollution in the basic level.
CO3	PO1 (Medium)	It involves **fair** theory in alloys behavior and one component system.
	PO2 (Low)	It provides **basic** theories in one and two component system.
	PO3 (Low)	It involves **basic** ideas providing solution to alloys manufacturing and eutectic compounds.
	PO5 (Low)	It involves **basic** concepts in two components system, lead silver system.
	PO6 (Low)	It applies the **basic** contextual knowledge to address the issues of social, health and safety issues.
	PO10 (Low)	It involves **basic** futuristic idea in finding solution for rusting of iron and making stainless steel types.
	PO12 (Low)	It provides **basic** idea in the usage and importance of alloys in everyday life.
CO4	PO1 (Medium)	It provides **fair** ideas on all the types fuels and their applications in various fields.
	PO2 (Low)	It provides only few **basic** ideas on the combustion process. Only two types of analysis are explained for solid fuel.
	PO5 (Medium)	It describes **fair** production of power alcohol and biodiesel using modern technologies and the applications fuels in various fields using latest equipment.
	PO6 (Medium)	It provides **fair** knowledge to address the issues of social and safety issues.
	PO10 (Medium)	It provides **fair** ideas to finding the solution for making and handling the fuels in an effective manner. It gives the demand and leads to both in air and water pollution in the basic level.

	PO12 (Low)	It provides **basic** idea in the usage and importance of gaseous fuels and alternative source of energy.
CO5	PO1 (Medium)	It provides **fair** ideas on all the types energy sources and their usage in various industries and fields.
	PO2 (Low)	It provides **basic** fundamental properties of nuclear fission and nuclear fusion.
	PO3 (Medium)	It applies the **fair** contextual knowledge in alternative energy production and also renewable energies for addressing the issues of social and safety issues.
	PO5 (Low)	It provides **basic** concepts on alternative energy production and also renewable energies.
	PO6 (Medium)	It involves **fair** theory for the conversion of solar energies and nuclear energies.
	PO7 (Medium)	It provides some **fair** applications in the pollution prevention and alternative energy resources.
	PO10 (Low)	It describes the **basic** futuristic idea in finding solution in the field of battery technology for mobiles and UPS.
	PO12 (Low)	It deals the **basic** ideas in the significance and applications of all types of energies in everyday life.

COURSE CODE & NAME : C105 & PROBLEM SOLVING AND PYTHON PROGRAMMING														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C105.1	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**
C105.2	**3**	**3**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**
C105.3	**3**	**3**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**
C105.4	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**
C105.5	**3**	**3**	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**
C105	**3.00**	**2.60**	**2.60**	**2.00**	**2.33**	**-**	**-**	**-**	**-**	**-**	**-**	**2.00**	**-**	**-**

Course Outcome Number	**Mapped with POs**	**Justification**
CO 1	PO1 (High)	It involves **strong** theory in science and mathematics related to computational thinking and algorithmic problem-solving techniques
	PO2 (Medium)	It involves **fair** ideas in the first principles of mathematics, science, and engineering sciences related to computational thinking and algorithmic problem-solving techniques
	PO3 (Medium)	It provides **fair** ideas for finding solutions to complex problems related to computational thinking and algorithmic problem- solving techniques
	PO12 (Medium)	It involves **fair** ideas in independent and life-long learning related to computational thinking and algorithmic problem-solving techniques
CO 2	PO1 (High)	It involves **strong** theory in science and mathematics related to data types, expressions, and statements to apply them in building simple Python programs which need Python programming constructs
	PO2 (High)	It involves **strong** theory with first principles of mathematics, science, and engineering sciences related to data types, expressions, and statements to apply them in building simple Python programs which need Python programming constructs
	PO3 (High)	It involves **strong** theory providing solutions to complex problems related to data types, expressions, and statements to apply them in building simple Python programs which need Python programming constructs

	PO4 (Medium)	It involves **fair** theory for the design of experiments and synthesis of information related to data types, expressions, and statements to apply them in building simple Python programs which need Python programming constructs
	PO5 (Medium)	It provides **fair** ideas in applying modern engineering and IT tools related to data types, expressions, and statements to apply them in building simple Python programs which need Python programming constructs
	PO12 (Medium)	It involves **fair** ideas in independent and life-long learning related to data types, expressions, and statements to apply them in building simple Python programs which need Python programming constructs
CO 3	PO1 (High)	It involves **strong** theory in science and mathematics related to solving real-time computational problems by using conditionals, looping, functions, and strings.
	PO2 (High)	It involves **strong** theory with the first principles of mathematics, science, and engineering sciences related to solving real-time computational problems by using conditionals, looping, functions, and strings.
	PO3 (High)	It involves **strong** theory providing solutions to complex problems related to solving real-time computational problems by using conditionals, looping, functions, and strings.
	PO4 (Medium)	It involves **fair** theory for the design of experiments and synthesis of information related to solving real-time computational problems by using conditionals, looping functions, and strings.
	PO5 (Medium)	It provides **fair** ideas for applying modern engineering and IT tools related to solving real-time computational problems by using conditionals, looping functions, and strings.
	PO12 (Medium)	It involves **fair** ideas in independent and life-long learning related to solving real-time computational problems by using conditionals, looping functions, and strings.
CO 4	PO1 (High)	It involves **strong** theory in science and mathematics related to compound data using Python lists, tuples, and dictionaries
	PO2 (Medium)	It involves **fair** ideas in the first principles of mathematics, science, and engineering sciences related to compound data using Python lists, tuples, and dictionaries
	PO3 (Medium)	It provides **fair** ideas for finding solutions to complex problems related to compound data using Python lists, tuples, and dictionaries

	PO12 (Medium)	It involves **fair** ideas in independent and life-long learning related to compound data using Python lists, tuples, and dictionaries
CO 5	PO1 (High)	It involves **strong** theory in science and mathematics related to solving computational problems by using modules, files, and Python packages
	PO2 (High)	It involves **strong** theory with the first principles of mathematics, science, and engineering sciences related to solving computational problems by using modules, files, and Python packages
	PO3 (High)	It involves **strong** theory providing solutions to complex problems related to solving computational problems by using modules, files, and Python packages
	PO4 (Medium)	It involves **fair** theory for the design of experiments and the synthesis of information related to solving computational problems by using modules, files, and Python packages
	PO5 (High)	It provides **strong** ideas for applying modern engineering and IT tools related to solving computational problems by using modules, files, and Python packages
	PO12 (Medium)	It involves **fair** ideas in independent and life-long learning related to solving computational problems by using modules, files, and Python packages

COURSE CODE & NAME : C106 & ENGINEERING GRAPHICS													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C106.1	**1**	**1**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**2**	**-**	**-**
C106.2	**1**	**1**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**2**	**-**	**-**
C106.3	**1**	**1**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**2**	**-**	**-**
C106.4	**1**	**1**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**2**	**-**	**-**
C106.5	**1**	**1**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**2**	**-**	**-**
C106	**1.00**	**1.00**	**2.00**	**1.00**	**-**	**-**	**-**	**-**	**-**	**2.00**	**-**	**2.00**	**-**	**-**

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (Low)	Students can identify and co-relate the **basic** knowledge of mathematics such as different unit conversions and thus they can acquire fundamental engineering drawing standards.
	PO2 (Low)	Students will be able to analyze and design **basic** engineering problems for geometrical construction basically.
	PO3 (Medium)	Students will be able to design and develop solutions **moderately** for complex engineering problems and design system components of geometry.
	PO4 (Low)	They will be able to synthesize the **basic** information and arrive at conclusions regarding the layout of views.
	PO10 (Medium)	Students will be able to communicate the works effectively to engineering community and society at **moderate** level of engineering practice.
	PO12 (Medium)	Students will be able to recognize **moderate** the need for & engage in independent and life-long learning in the context of technological change in engineering drawing.
CO2	PO1 (Low)	Students will get **basic** engineering knowledge to ketch the various sections, curve etc.,
	PO2 (Low)	Students will be able to analyze **basic** design for complex engineering problems for geometrical construction.

	PO3 (Medium)	Students will be able to design and develop **moderate** solutions for complex engineering problems and design system components of engineering drawing.
	PO4 (Low)	They will be able to synthesize the **basic** information and arrive at conclusions regarding the orthographic projection.
	PO10 (Medium)	Students will be able to communicate the works effectively to engineering community and society at large engineering drawing projections with **moderate** level.
	PO12 (Medium)	Students will be able to recognize the need for & engage in independent and life-long learning in the context of technological change of graphical methods and visualization techniques **moderately.**
CO3	PO1 (Low)	The **basic** knowledge will provide the sketching knowledge of simple solids like prisms, pyramids, cylinder
	PO2 (Low)	Students will be able to analyze **basic** design for complex engineering problems for geometrical construction of solids.
	PO3 (Medium)	Students will be able to design and develop solutions for complex engineering problems and design system components of traces Projection of Planes.
	PO4 (Low)	They will be able to synthesize the **basic** information and arrive at conclusions regarding the First angle projection of planes.
	PO10 (Medium)	Students will be able to communicate the works effectively to engineering community and society at large about the Orthographic projection.
	PO12 (Medium)	Students will be able to recognize the need for & engage in independent and life-long learning in the context of technological change in Principal planes of graphics.
CO4	PO1 (Low)	Engineering **fundamental** knowledge will provide the sketching knowledge of sectional view by simple solids like prisms, pyramids, cylinder etc.,
	PO2 (Low)	Students will be able to analyze **basics** of design for complex engineering problems in geometrical construction.
	PO3 (Medium)	Students will be able to design and develop solutions for complex engineering problems and design system components of solids.
	PO4 (Low)	They will be able to synthesize the **basic** information and arrive at conclusions regarding the Sectioning of above solids
	PO10 (Medium)	Students will be able to communicate the works effectively to engineering community and society at large obtaining true

		shape of section from solids.
CO5	PO1(Low)	Engineering **fundamental** knowledge will provide the sketching knowledge of sectional view by simple truncated prisms, pyramids, cylinder etc.,
	PO2 (Low)	Students will be able to analyze the **basic** design and complex engineering problems for isometric geometrical construction.
	PO3 (Medium)	Students will be able to design and develop solutions for complex engineering problems and design system components of combination of two solid objects in simple vertical positions.
	PO4 (Low)	They will be able to synthesize the information and arrive at conclusions regarding the isometric scale.
	PO10 (Medium)	Students will be able to communicate the works effectively to engineering community and society at large about the Perspective projection of simple solids.

COURSE CODE & NAME : C107 & PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C107.1	**3**	**2**	**2**	**-**	**2**	**-**	**-**	**-**	**3**	**-**	**2**	**2**	**-**	**-**
C107.2	**3**	**3**	**3**	**2**	**2**	**-**	**-**	**-**	**2**	**-**	**2**	**2**	**-**	**-**
C107.3	**3**	**2**	**1**	**2**	**-**	**-**	**-**	**-**	**2**	**-**	**2**	**2**	**-**	**-**
C107.4	**3**	**2**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**2**	**-**	**2**	**-**	**-**
C107.5	**3**	**3**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**2**	**-**	**2**	**-**	**-**
C107	**3.00**	**2.40**	**2.20**	**2.00**	**2.00**	**-**	**-**	**-**	**2.33**	**2.00**	**2.00**	**2.00**	**-**	**-**

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It involves **strong** theory in science and mathematics related to developing Python programs for applying the concepts of data types, expressions, and Python statements
	PO2 (Medium)	It involves **fair** ideas in the first principles of mathematics, science, and engineering sciences related to developing Python programs for applying the concepts of data types, expressions, and Python statements
	PO3 (Medium)	It provides **fair** ideas for finding solutions to complex problems related to developing Python programs for applying the concepts of data types, expressions, and Python statements
	PO5 (Medium)	It provides **fair** ideas for applying modern engineering and IT tools related to developing Python programs for applying the concepts of data types, expressions, and Python statements
	PO9(Medium)	It provides **fair** ideas to Individual and team work related to developing Python programs for applying the concepts of data types, expressions, and Python statements
	PO11(High)	It involves **strong** theory to manage projects related to developing Python programs for applying the concepts of data types, expressions, and Python statements
	PO12 (Medium)	It involves **fair** ideas in independent and life-long learning related to developing Python programs for applying the concepts of data types, expressions, and Python statements
CO2	PO1 (High)	It involves **strong** theory in science and mathematics related to developing Python programs using conditionals, looping, functions, and strings for solving real-time computational problems.

	PO2 (High)	It involves **strong** ideas in the first principles of mathematics, science, and engineering sciences related to developing Python programs using conditionals, looping, functions, and strings for solving real-time computational problems.
	PO3 (High)	It provides **strong** ideas for finding solutions to complex problems related to developing Python programs using conditionals, looping, functions, and strings for solving real-time computational problems.
	PO4(Medium)	It involves **fair** theory for the design of experiments and synthesis of information related to developing Python programs using conditionals, looping, functions, and strings for solving real-time computational problems.
	PO5 (Medium)	It provides **fair** ideas for applying modern engineering and IT tools related to developing Python programs using conditionals, looping, functions, and strings for solving real-time computational problems.
	PO9 (Medium)	It provides **fair** ideas to Individual and team work related to developing Python programs using conditionals, looping, functions, and strings for solving real-time computational problems.
	PO11(High)	It involves **strong** theory to manage projects related to developing Python programs using conditionals, looping, functions, and strings for solving real-time computational problems.
	PO12 (Medium)	It involves **fair** ideas in independent and life-long learning related to developing Python programs using conditionals, looping, functions, and strings for solving real-time computational problems.
CO 3	PO1 (High)	It involves **strong** theory in science and mathematics related to compound data using Python lists, tuples, and dictionaries
	PO2 (Medium)	It involves **fair** ideas in the first principles of mathematics, science, and engineering sciences related to compound data using Python lists, tuples, and dictionaries
	PO3 (Low)	It provides **basic** ideas for finding solutions to complex problems related to compound data using Python lists, tuples, and dictionaries
	PO4 (Medium)	It involves **fair** theory for the design of experiments and synthesis of information related to compound data using Python lists, tuples, and dictionaries
	PO9 (Medium)	It provides **fair** ideas for Individual and teamwork related to compound data using Python lists, tuples, and dictionaries
	PO11(High)	It involves **strong** theory to manage projects related to compound data using Python lists, tuples, and dictionaries
	PO12 (Medium)	It involves **fair** ideas in independent and life-long learning related to compound data using Python lists, tuples, and dictionaries
CO 4	PO1 (High)	It involves **strong** theory in science and mathematics related to developing Python programs for solving problems by using modules, files, and Python packages

	PO2 (Medium)	It involves **fair** ideas in the first principles of mathematics, science, and engineering sciences related to developing Python programs for solving problems by using modules, files, and Python packages
	PO3 (Medium)	It provides **fair** ideas for finding solutions to complex problems related to developing Python programs for solving problems by using modules, files, and Python packages
	PO4 (Medium)	It involves **fair** theory for the design of experiments and synthesis of information related to developing Python programs for solving problems by using modules, files, and Python packages
	PO5 (Medium)	It provides **fair** ideas for applying modern engineering and IT tools related to developing Python programs for solving problems by using modules, files, and Python packages
	PO10 (Medium)	It provides **fair** ideas for Communicating effectively on complex engineering activities related to developing Python programs for solving problems by using modules, files, and Python packages
	PO12 (Medium)	It involves **fair** ideas in independent and life-long learning related to developing Python programs for solving problems by using modules, files, and Python packages
CO 5	PO1 (High)	It involves **strong** theory in science and mathematics related to utilizing Python packages for developing real-world software applications
	PO2 (High)	It involves **strong** ideas in the first principles of mathematics, science, and engineering sciences related to utilizing Python packages for developing real-world software applications
	PO3 (High)	It provides **strong** ideas for finding solutions to complex problems related to utilizing Python packages for developing real- world software applications.
	PO4(Medium)	It involves **fair** theory for the design of experiments and synthesis of information related to utilizing Python packages for developing real-world software applications
	PO5 (Medium)	It provides **fair** ideas for applying modern engineering and IT tools related to utilizing Python packages for developing real-world software applications
	PO10(Medium)	It provides **fair** ideas for Communicating effectively on complex engineering activities related to utilizing Python packages for developing real-world software applications
	PO12 (Medium)	It involves **fair** ideas in independent and life-long learning related to utilizing Python packages for developing real-world software applications

COURSE CODE & NAME : C108 & PHYSICS AND CHEMISTRY LABORATORY

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C108.1	2	2	-	-	-	-	-	-	-	-	-	1	-	-
C108.2	2	2	-	-	-	-	-	-	-	-	-	1	-	-
C108.3	3	2	-	-	-	-	2	-	-	-	-	-	-	-
C108.4	3	2	-	-	-	-	3	-	-	-	-	1	-	-
C108.5	3	2	-	-	-	-	3	-	-	-	-	1	-	-
C108	2.60	2.00	-	-	-	-	2.67	-	-	-	-	1.00	-	-

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (Medium)	It involves **fair** theory in physics and chemistry related to identify the requirements for the real world problems and identify the correct methodology to known the parameter values.
	PO2 (Medium)	It provides **fair** idea in the principles of physics and chemistry. Science and engineering technology related to identify the problems to resolve the fundamental, modern and futuristic methodology.
	PO12 (Low)	It provides **basic** knowledge to engage in independent and life-long learning related to identify requirements for the real world problems.
CO2	PO1 (Medium)	It involves **fair** theory in physics and chemistry related to identify the requirements for the real world problems and identify the correct methodology to known the parameter values.
	PO2 (Medium)	It provides **fair** idea in the principles of physics and chemistry. Science and engineering technology related to identify the problems to resolve the fundamental, modern and futuristic methodology.
	PO12 (Low)	It provides **basic** knowledge to engage in independent and life-long learning related to identify requirements for the real world problems.
CO3	PO1 (Medium)	It involves **fair** theory in physics and chemistry related to identify the requirements for the real world problems and identify the correct methodology to known the parameter values.
	PO2 (Medium)	It provides **fair** idea in the principles of physics and chemistry. Science and engineering technology related to identify the problems to resolve the fundamental, modern and futuristic methodology.
	PO7 (Medium)	It involves **fair** understanding of the impact of the professional engineering solutions in societal and environmental contexts related to identify requirements for the real world problems and know the new methodology.

CO4	PO1 (Medium)	It involves **fair** theory in physics and chemistry related to identify the requirements for the real world problems and identify the correct methodology to known the parameter values.
	PO2 (Medium)	It provides **fair** idea in the principles of physics and chemistry. Science and engineering technology related to identify the problems to resolve the fundamental, modern and futuristic methodology.
	PO7 (High)	It involves **strong** understanding of the impact of the professional engineering solutions in societal and environmental contexts related to identify requirements for the real world problems and know the new methodology.
	PO12 (Low)	It provides **basic** knowledge to engage in independent and life-long learning related to identify requirements for the real world problems.
CO5	PO1 (Medium)	It involves **fair** theory in physics and chemistry related to identify the requirements for the real world problems and identify the correct methodology to known the parameter values.
	PO2 (Medium)	It provides **fair** idea in the principles of physics and chemistry. Science and engineering technology related to identify the problems to resolve the fundamental, modern and futuristic methodology.
	PO7 (High)	It involves **strong** understanding of the impact of the professional engineering solutions in societal and environmental contexts related to identify requirements for the real world problems and know the new methodology.
	PO12 (Low)	It provides **basic** knowledge to engage in independent and life-long learning related to identify requirements for the real world problems.

COURSE CODE & NAME : C109 & TECHNICAL ENGLISH

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C109.1	-	-	-	-	-	-	-	2	3	3	-	3	-	-
C109.2	-	-	-	-	-	-	-	1	2	3	-	3	-	-
C109.3	-	-	-	-	-	-	-	2	3	3	-	3	-	-
C109.4	-	-	-	-	-	-	-	2	2	3	-	3	-	-
C109.5	-	-	-	-	-	-	-	2	3	3	-	3	-	-
C109	-	-	-	-	-	-	-	1.80	2.60	3.00	-	3.00	-	-

Course Outcome Number	Mapped with POs	Justification
CO1	PO8 (Medium)	It **fair** enables the students to write technical articles by following the ethics in written communication.
	PO9 (High)	It **strongly** helps the students to enhance their technical knowledge to perform well in a team.
	PO10 (High)	It **strong** hones the communication skills of the students.
	PO12 (High)	It **strongly** enhances the knowledge level and learning skills of the students in their life.
CO2	PO8 (Low)	It **basic** motivates the students to follow professional ethics while responding to lectures.
	PO9 (Medium)	It **fair** helps them to change their attitude and body language to excel as a team leader.
	PO10 (High)	It **strong** enhances the communication skills of the students.
	PO12 (High)	It **strong** helps them to update the latest technology in their life.
CO3	PO8 (Medium)	It **fair** helps them to perform well in public speaking by following the ethics.

	PO9 (High)	It **strong** enables the students to speak well as an individual as well as in a team.
	PO10 (High)	It **strongly** builds the communication skills of the students.
	PO12 (High)	It **strong** enhances the speaking skills of the students in their life.
CO4	PO8 (Medium)	It **fair** provides knowledge to the students to create CV by following the professional ethics.
	PO9 (Medium)	It **fair** improves confidence level of the students to perform in a team.
	PO10 (High)	It **strong** enables to communicate in an effective manner.
	PO12 (High)	It **strong** helps them to create and update their CV periodically in their life.
CO5	PO8 (Medium)	It **fair** provides sufficient knowledge about LSRW skills and the ethics to be followed in communication.
	PO9 (High)	It **strong** enables the students to speak well as an individual as well as in a team.
	PO10 (High)	It **strong** hones LSRW skills of the students.
	PO12 (High)	It **strong** helps the students to learn innovative ideas about various communication strategies to be followed in their life.

COURSE CODE & NAME : C110 & ENGINEERING MATHEMATICS - II														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C110.1	**3**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**-**
C110.2	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**
C110.3	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**
C110.4	**3**	**3**	**2**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
C110.5	**3**	**3**	**2**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**-**
C110	**3.00**	**3.00**	**1.80**	**-**	**1.00**	**-**	**-**	**-**	**-**	**-**	**1.50**	**2.00**	**-**	**-**

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It involves **strong** knowledge in solving complex Engineering problems related to the different types of matrices.
	PO2 (High)	It provides **strong** idea in analyzing and solving complex Engineering problems related to the different types of matrices.
	PO3 (Low)	It provides **basic** idea in designing the solution to complex Engineering problems related to the different types of matrices.
	PO11 (Medium)	It provides **fair** knowledge of engineering and management principle to manage projects in multidisciplinary environments related to the different types of matrices.
	PO12 (Medium)	It implicates **fair** idea for preparing and to engage independent and life - long learning in the technological change related to the concept of different types of matrices.
CO2	PO1 (High)	It involves **strong** knowledge in engineering field related to applying Gradient, divergence and curl of a vector point function and related identities.
	PO2 (High)	It provides **strong** idea in analyzing engineering field related to applying Gradient, divergence and curl of a vector point function and related identities.
	PO3 (Medium)	It provides **fair** idea in designing the engineering problems related to applying Gradient, divergence and curl of a vector point function and related identities.
	PO11 (Low)	It provides **basic** knowledge of engineering and management principle to manage projects in multidisciplinary environments related to Gradient, divergence and curl of a vector point function

		and related identities.
CO3	PO1 (High)	It involves **strong** knowledge to solve the engineering problems related to the concept of analytic functions.
	PO2 (High)	It provides **strong** idea in analyzing and solving the engineering problems related to the concept of analytic functions.
	PO3 (Medium)	It provides **fair** idea in designing and solving the engineering problems related to the concept of analytic functions.
	PO11 (Low)	It provides **basic** knowledge of engineering and management principle to manage projects in multidisciplinary environments related to the concept of analytic functions.
CO4	PO1 (High)	It involves **strong** knowledge in applying and solving the different methods of complex Engineering problems related to Complex integration problems.
	PO2 (High)	It provides **strong** idea in analyzing the different methods of complex Engineering problems related to Complex integration problems.
	PO3 (Medium)	It provides **fair** idea in designing the different methods of complex Engineering problems related to Complex integration problems.
	PO5 (Low)	It provides **basic** knowledge of engineering and management principle to manage projects in multidisciplinary environments related to Complex integration problems.
CO5	PO1 (High)	It involves **strong** knowledge in creating and managing the projects related to the fundamentals of Laplace transforms.
	PO2 (High)	It provides **strong** idea in analyzing, creating and managing the projects related to the fundamentals of Laplace transforms
	PO3 (Medium)	It provides **fair** idea in designing, creating and managing the projects related to the fundamentals of Laplace transforms.
	PO5 (Low)	It provides **basic** idea in applying the appropriate techniques and tools in Engineering activities related to the fundamentals of Laplace transforms.
	PO11 (Medium)	It provides **fair** knowledge of engineering and management principle to manage projects in multidisciplinary environments related to the fundamentals of Laplace transforms.
	PO12 (Medium)	It implicates **fair** idea for preparing and to engage independent and life - long learning in the technological change related to the fundamentals of Laplace transforms.

COURSE CODE & NAME : C111 & PHYSICS FOR ELECTRONICS ENGINEERING														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C111.1	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
C111.2	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
C111.3	**2**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
C111.4	**3**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
C111.5	**2**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
C111	**2.40**	**1.50**	**-**	**-**	**1.67**	**-**	**-**	**-**	**-**	**-**	**-**	**1.00**	**-**	**-**

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It involves **strong** theoretical knowledge in classical, quantum and electron band theories.
	PO2 (Medium)	It provides **fair** idea in complex problems in effective mass and concept of hole.
CO2	PO1 (High)	It involves **strong** engineering knowledge in semiconductor physics.
	PO2 (Medium)	It provides **fair** in problem analysis in carrier concentration in semiconductors and devices.
CO3	PO1 (Medium)	It involves **fair** knowledge on magnetic and dielectric properties of materials.
	PO5 (Low)	It provides **basic** understanding on the functioning of modern dielectric materials.
	PO12 (Low)	It gives **basic** idea in continuous learning in the magnetic and dielectric properties of materials.
CO4	PO1 (High)	It provides **strong** knowledge on absorption, emission and scattering of light in metals, insulators and semiconductors.
	PO5 (Medium)	It provides **fair** understanding on the functioning of modern optical materials for optoelectronics.

	PO12 (Low)	It gives **basic** idea in continuous learning of properties and various optoelectronic devices.
CO5	PO1 (High)	It involves **strong** knowledge in quantum structures.
	PO5 (Medium)	It provides **fair** idea in applying modern physics and tools related to identify requirements for the single electron transistor and spintronics.
	PO12 (Low)	It provides **basic** idea to recognize the need for quantum dots structure in spintronics and carbon electronics.

COURSE CODE & NAME : C112 & BASIC CIVIL AND MECHANICAL ENGINEERING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C112.1	2	1	-	-	1	-	-	-	-	-	-	-	-	-
C112.2	2	1	1	1	1	-	-	-	-	-	-	-	-	-
C112.3	2	1	-	-	2	-	3	-	3	-	-	-	-	-
C112.4	2	1	-	2	2	-	-	-	-	-	-	-	-	-
C112.5	2	1	-	-	-	-	-	-	-	-	-	-	-	-
C112	2.00	1.00	1.00	1.50	1.50	-	3.00	-	3.00	-	-	-	-	-

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (Medium)	It involves **fair** theoretical knowledge in classical, quantum and electron band theories.
	PO2 (Low)	It provides **basic** idea in complex problems in effective mass and concept of hole.
	PO5 (Low)	It involve **basic** apply appropriate techniques, resources, and modern engineering
CO2	PO1 (Medium)	It involves **fair** theoretical knowledge in classical, quantum and electron band theories.
	PO2 (Low)	It provides **basic** idea in complex problems in effective mass and concept of hole.
	PO3 (Low)	It involve **basic** Design solutions for complex engineering problems
	PO4 (Low)	It gives **Poor** research-based knowledge
	PO5 (Low)	It involve **basic** r apply appropriate techniques, resources, and modern engineering
CO3	PO1 (Medium)	It involves **fair** theoretical knowledge in classical, quantum and electron band theories.

	PO2 (Low)	It provides **basic** idea in complex problems in effective mass and concept of hole.
	PO5 (Medium)	It involve **fair** apply appropriate techniques, resources, and modern engineering
	PO7 (High)	It provides **Strong** professional engineering solutions in societal and environmental contexts
	PO9 (High)	It provides **Strong** function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
CO4	PO1 (Medium)	It involves **strong** theoretical knowledge in classical, quantum and electron band theories.
	PO2 (Low)	It provides **basic** idea in complex problems in effective mass and concept of hole.
	PO4 (Medium)	It gives **fair** research-based knowledge
	PO5 (Medium)	It involve **fair** apply appropriate techniques, resources, and modern engineering
CO5	PO1 (Medium)	It involves **fair** theoretical knowledge in classical, quantum and electron band theories.
	PO2 (Low)	It provides **basic** idea in complex problems in effective mass and concept of hole.

COURSE CODE & NAME : C113 & CIRCUIT THEORY														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C113.1	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
C113.2	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**2**
C113.3	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**2**
C113.4	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**1**	**2**
C113.5	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**2**
C113	**3.00**	**2.00**	**2.00**	**2.00**	**-**	**-**	**-**	**-**	**3.00**	**-**	**-**	**-**	**1.00**	**2.00**

Course Outcome Number	**Mapped with POs**	**Justification**
CO1	PO1 (High)	It involves **strong** theoretical knowledge in knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It gives **fair** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (Medium)	It involve **fair** Design solutions for complex engineering problems and design system components
	PO4(Medium)	It give **fair** Use research-based knowledge and research methods including design of experiments
	PSO2 (Medium)	It gives **fair** apply appropriate techniques, resources, and modern engineering
CO2	PO1 (High)	It involves **strong** theoretical knowledge in knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It gives **fair** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (Medium)	It involve **fair** Design solutions for complex engineering problems and design system components
	PO4(Medium)	It give **fair** Use research-based knowledge and research methods including design of experiments

	PSO1(Low)	It provides **basic** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It involves **strong** theoretical knowledge in knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It gives **fair** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (Medium)	It involve **fair** Design solutions for complex engineering problems and design system components
	PO4(Medium)	It give **fair** Use research-based knowledge and research methods including design of experiments
	PSO1(Low)	It provides **basic** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It involves **strong** theoretical knowledge in knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It gives **fair** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (Medium)	It involve **fair** Design solutions for complex engineering problems and design system components
	PO4(Medium)	It give **fair** Use research-based knowledge and research methods including design of experiments
	PO9 (High)	It gives **Strong** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PSO1(Low)	It provides **basic** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It involves **strong** theoretical knowledge in knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

	PO2 (Medium)	It gives **fair** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (Medium)	It involve **fair** Design solutions for complex engineering problems and design system components
	PO4(Medium)	It give **fair** Use research-based knowledge and research methods including design of experiments
	PSO1(Low)	It provides **basic** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C114 & ENVIRONMENTAL SCIENCE AND ENGINEERING														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C114.1	**2**	**-**	**-**	**-**	**-**	**2**	**3**	**-**	**1**	**-**	**-**	**1**	**-**	**-**
C114.2	**-**	**-**	**-**	**-**	**-**	**1**	**3**	**-**	**1**	**-**	**-**	**1**	**-**	**-**
C114.3	**-**	**-**	**-**	**-**	**-**	**1**	**3**	**-**	**3**	**-**	**-**	**1**	**-**	**-**
C114.4	**2**	**-**	**-**	**-**	**-**	**1**	**3**	**-**	**3**	**-**	**-**	**1**	**-**	**-**
C114.5	**2**	**-**	**-**	**-**	**-**	**2**	**3**	**-**	**3**	**-**	**-**	**1**	**-**	**-**
C114	**2.00**	**-**	**-**	**-**	**-**	**1.40**	**3.00**	**-**	**2.20**	**-**	**-**	**1.00**	**-**	**-**

Course Outcome Number	Mapped with POs	Justification
CO 1	PO1 (Medium)	It describes the **fair** knowledge in environment, eco system and biodiversity problems in everyday life.
	PO6 (Medium)	It provides **fair** valuable idea to the societal, health and safety measures of bio diversity.
	PO7 (High)	It explains **strong** the environmental sustainability of the eco system and its importance of bio-diversity.
	PO9 (Low)	It deals **basic** the eco system of the field study in the practices of engineering technology.
	PO12 (Low)	It provides **basic** appreciation and remembrance and aware of the advancement of futuristic.
CO 2	PO6 (Low)	It gives the **basic** beneficial idea to the survive of the living things in the societal, health and safety measures of environmental pollution.
	PO7 (High)	It describes the **strong** criteria for the environmental pollution and its types, need for the sustainability in the recovery of pollution parameters.
	PO9 (Low)	It deals **basic** the environmental pollution and its causes of the field study in urban/rural/industrial/agricultural.
CO 3	PO6 (Low)	It involves **basic** ideas providing to resolve the engineering solution of natural resources.

	PO7 (High)	It describes the **strong** criteria for the environmental pollution and its types, need for the sustainability in the recovery of pollution parameters.
	PO9 (High)	It deals **strong** the natural resources and its causes of the field study in river/forest/hill/mountain.
	PO12 (Low)	It gives **basic** the lean knowledge about the natural resources and its technological advancement.
CO 4	PO1 (Medium)	It involves **fair** theory in social issues and its environment.
	PO6 (Low)	It involves **basic** ideas providing to resolve the engineering solution of natural resources
	PO7 (High)	It describes the **strong** criteria for the environmental pollution and its types, need for the sustainability in the recovery of pollution parameters.
	PO9 (High)	It deals **strong** the social issues of the environment to conduct the awareness programme through the NSS/as well as students programme
	PO12 (Low)	It gives **basic** the simple idea of the environmental issues and its awareness.
CO 5	PO1 (Medium)	It provides **fair** the **elementary** principle in human pollution and the environment.
	PO6 (Medium)	It involves **fair comprehensive** ideas providing to resolve the engineering solution of the human rights and its principles.
	PO7 (High)	It describes **strong** the **forthright** of the value education for the environmental and human pollution and its types, need for the sustainability in the recovery of pollution parameters.
	PO9 (High)	It deals **strong** the case studies of the human health environment to conduct the awareness programme.
	PO12 (Low)	It gives **basic** the modest idea for the information technology to resolve the environmental and pollution issues.

COURSE CODE & NAME : C115 & ENGINEERING PRACTICES LABORATORY

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C115.1	1	1	2	1	-	-	-	-	-	2	-	2	1	1
C115.2	1	1	2	1	-	-	-	-	-	2	-	2	1	1
C115.3	1	1	2	1	-	-	-	-	-	2	-	2	3	3
C115.4	1	1	2	1	-	-	-	-	-	2	-	2	3	3
C115.5	1	1	2	1	-	-	-	-	-	2	-	2	2	2
C115	1.00	1.00	2.00	1.00	-	-	-	-	-	2.00	-	2.00	2.00	2.20

Course Outcome Number	Mapped with POs	Justification
CO 1	PO1 (Low)	It describes the **basic** knowledge about safety practices need to follow inside the Workshop and give priority towards safety while working as an engineer.
	PO2 (Low)	It provides **basic** valuable awareness of the tools using for work always need to be in safe condition, if not it may injure the person or the society.
	PO3 (Medium)	It explains the **fair** knowledge of various tools is helpful during practical life.
	PO4 (Low)	It deals the **basic** Aware of ethics in using measuring devices.
	PO10 (Medium)	It provides **fair** aware of the need for time management and teamwork for effectively Completing the work on time.
	PO12 (Medium)	It gives **fair** Knowledge of various tools and handling technique will support for lifelong learning
	PSO1(Low)	It provides **basic** the modern tools and provide solutions for the real time problems related to energy conservation.
	PSO2(Low)	It gives **basic** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO 2	PO1 (Low)	It describes the **basic** knowledge in evaluate various manufacturing processes like casting.

	PO2 (Low)	It provides **basic** valuable make product using casting techniques.
	PO3 (Medium)	It explains the **fair** identify the technological changes that occur in casting processes that will occur in future.
	PO4 (Low)	It deals the **basic** to evaluate rolling process.
	PO10 (Medium)	It provides **fair** apply their fundamental knowledge towards understanding rolling process and its application so that it can be used for the benefit of society.
	PO12 (Medium)	It gives **fair** identify the technological changes that occur in rolling processes.
	PSO1(Low)	It provides **basic** the modern tools and provide solutions for the real time problems related to energy conservation.
	PSO2(Low)	It gives **basic** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO 3	PO1 (Low)	It describes the **basic** knowledge in environment, eco system and biodiversity problems in everyday life.
	PO2 (Low)	It provides **basic** valuable idea to the societal, health and safety measures of bio diversity.
	PO3 (Medium)	It explains the **fair** environmental sustainability of the eco system and its importance of bio-diversity.
	PO4 (Low)	It deals the **basic** eco system of the field study in the practices of engineering technology.
	PO10 (Medium)	It provides **fair** appreciation and remembrance and aware of the advancement of futuristic.
	PO12 (Medium)	It gives **fair** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

CO 4	PO1 (Low)	It describes the **basic** knowledge in environment, eco system and biodiversity problems in everyday life.
	PO2 (Low)	It provides **basic** valuable idea to the societal, health and safety measures of bio diversity.
	PO3 (Medium)	It explains the **fair** environmental sustainability of the eco system and its importance of bio-diversity.
	PO4 (Low)	It deals the **basic** eco system of the field study in the practices of engineering technology.
	PO10 (Medium)	It provides **fair** appreciation and remembrance and aware of the advancement of futuristic.
	PO12 (Medium)	It gives **fair** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO 5	PO1 (Low)	It describes the **basic** knowledge in environment, eco system and biodiversity problems in everyday life.
	PO2 (Low)	It provides **basic** valuable idea to the societal, health and safety measures of bio diversity.
	PO3 (Medium)	It explains the **fair** environmental sustainability of the eco system and its importance of bio-diversity.
	PO4 (Low)	It deals the **basic** eco system of the field study in the practices of engineering technology.
	PO10 (Medium)	It provides **fair** appreciation and remembrance and aware of the advancement of futuristic.
	PO12 (Medium)	It gives **fair** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable

		energy industries with ethical standards.

COURSE CODE & NAME : C116 & ELECTRIC CIRCUITS LABORATORY														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C116.1	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**	**3**	**3**	**2**
C116.2	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**	**3**	**3**	**2**
C116.3	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**	**3**	**3**	**2**
C116.4	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**	**3**	**3**	**2**
C116.5	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**	**3**	**3**	**2**
C116	**3.00**	**2.00**	**3.00**	**-**	**-**	**-**	**-**	**-**	**3.00**	**3.00**	**-**	**3.00**	**3.00**	**2.00**

Course Outcome Number	**Mapped with POs**	**Justification**
CO 1	PO 1 (High)	It gives **Strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
	PO 2 (Medium)	It Provide **fair** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics
	PO 3 (High)	It Involve **strong** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety
	PO 9 (High)	It Provide **strong** research-based knowledge and research methods including design of experiments
	PO 10 (High)	It gives **strong** complex engineering activities with the engineering community and with society at large
	PO 12 (High)	It Gives **strong** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO 2	PO 1 (High)	It gives **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
	PO 2 (Medium)	It Provide **fair** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics
	PO 3 (High)	It Involve **strong** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety
	PO 9 (High)	It Provide **strong** research-based knowledge and research methods including design of experiments
	PO 10 (High)	It gives s**trong** complex engineering activities with the engineering community and with society at large
	PO 12 (High)	It gives **strong** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO 3	PO 1 (High)	It gives **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
	PO 2 (Medium)	It Provide **fair** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics
	PO 3 (High)	It Involve **strong** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety
	PO 9 (High)	It Provide **strong** research-based knowledge and research methods including design of experiments

	PO 10 (High)	It gives **strong** complex engineering activities with the engineering community and with society at large
	PO 12 (High)	It Gives **strong** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO 4	PO 1 (High)	It gives **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
	PO 2 (Medium)	It Provide **fair** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics
	PO 3 (High)	It Involve **strong** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety
	PO 9 (High)	It Provide **strong** research-based knowledge and research methods including design of experiments
	PO 10 (High)	It gives **strong** complex engineering activities with the engineering community and with society at large
	PO 12 (High)	It Gives **strong** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
C0 5	PO 1 (High)	It gives **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
	PO 2 (Medium)	It Provide **fair** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics
	PO 3 (High)	It Involve **strong** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health

		and safety
	PO 9 (High)	It Provide **strong** research-based knowledge and research methods including design of experiments
	PO 10 (High)	It gives **strong** complex engineering activities with the engineering community and with society at large
	PO 12 (High)	It Gives **strong** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C201 & TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C201.1	3	3	-	-	-	-	-	-	-	-	-	-	-	2
C201.2	3	3	-	-	-	-	-	-	-	-	-	2	2	2
C201.3	3	2	3	-	3	-	-	-	-	-	-	2	-	2
C201.4	3	3	-	-	-	-	-	-	-	-	3	-	2	2
C201.5	3	3	-	-	-	-	-	-	-	-	2	2	2	2
C201	3.00	2.80	3.00	-	3.00	-	-	-	-	-	2.50	2.00	2.00	2.00

Course Outcome Number	Mapped with POs	Justification
CO 1	PO1 (High)	It involves **strong** knowledge in applying the Engineering knowledge in differentiation related to solve maxima and minima problems.
	PO2 (High)	It provides **strong** idea in analyzing the Engineering knowledge problems in differentiation related to solve maxima and minima problems.

	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
C0 2	PO1 (High)	It involves **strong** knowledge in solving the problems of integrals using different methods related to calculus.
	PO2 (High)	It provides **strong** idea in analyzing and the solving the problems of integrals using different methods related to calculus.
	PO12 (Medium)	It implicates **fair** idea for preparing and to engage independent and life - long learning in the technological change related to solving the problems of integrals using different methods of calculus.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO 3	PO1 (High)	It involves **strong** knowledge in designing and developing the problems of integration related to multiple integrals
	PO2 (Medium)	It provides **fair** idea in analyzing, designing and developing the problems of integration related to multiple integrals.
	PO3 (High)	It provides **strong** idea in designing the solution to the problems of integration related to multiple integrals.
	PO5 (High)	It provides **strong** appropriate techniques, resources, and modern engineering and IT tools including prediction.
	PO12(Medium)	It implicates **fair** idea for preparing and to engage independent and life - long learning in the technological change related to designing and developing the problems of integration related to multiple integrals.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO 4	PO1 (High)	It involves **strong** knowledge in solving the problems of integrals related to using various methods of integration.
	PO2 (High)	It provides **strong** idea in analyzing the problems of integrals related to using various methods of integration.
	PO11 (Medium)	It provides **fair** knowledge of engineering and management principle to manage projects in multidisciplinary

		environments related to analyzing the problems of integrals using various methods of integration.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO 5	PO1 (High)	It involves **strong** knowledge in applying various tools to recognize the need for life-long learning related to solving the differential equations.
	PO2 (High)	It provides **strong** idea in analyzing various tools to recognize the need for life-long learning related to solving the differential equations.
	PO11 (Medium)	It provides **fair** knowledge of engineering and management principle to manage projects in multidisciplinary environments related to solving the differential equations.
	PO12 (Medium)	It implicates **fair** idea for preparing and to engage independent and life - long learning in the technological change related to solving the differential equations.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C202 & DIGITAL LOGIC CIRCUITS

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C202.1	3	3	3	2	2	-	-	-	-	-	-	-	2	3
C202.2	2	3	3	3	1	-	-	-	-	-	-	-	2	3
C202.3	3	3	3	3	2	-	-	-	-	-	-	-	-	3
C202.4	3	3	3	3	2	-	-	-	-	-	-	-	-	3
C202.5	3	3	3	2	1	-	-	-	-	-	-	-	-	3
C202	2.80	3.00	3.00	2.60	1.60	-	-	-	-	-	-	-	2.00	3.00

Course Outcome Number	Mapped with POs	Justification
CO 1	PO 1 (High)	It gives **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
	PO 2 (High)	It Provide **strong** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics
	PO 3 (High)	It Involve **strong** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety
	PO 4 (Medium)	It gives **fair** research-based knowledge and research methods including design of experiments
	PO 5 (Medium)	It Provide **fair** research-based knowledge and research methods including design of experiments
	PSO 1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO 2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO 2	PO 1 (Medium)	It gives **fair** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems

	PO 2 (High)	It Provide **strong** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics.
	PO 3 (High)	It Involve **strong** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety.
	PO 4 (High)	It gives **strong** research-based knowledge and research methods including design of experiments.
	PO 5 (Low)	It Provide **basic** research-based knowledge and research methods including design of experiments.
	PSO 1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO 2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO 3	PO 1 (High)	It gives **Strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO 2 (High)	It Provide **Strong** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics
	PO 3 (High)	It Involve **strong** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety
	PO 4 (High)	It gives **strong** research-based knowledge and research methods including design of experiments
	PO 5 (Medium)	It Provide **fair** research-based knowledge and research methods including design of experiments
	PSO 2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO 4	PO 1 (High)	It gives **Strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
	PO 2 (High)	It Provide **Strong** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics

	PO 3 (High)	It Involve **strong** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety
	PO 4 (High)	It gives **strong** research-based knowledge and research methods including design of experiments
	PO 5 (Medium)	It Provide **fair** research-based knowledge and research methods including design of experiments
	PSO 2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO 5	PO 1 (High)	It gives **Strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
	PO 2 (High)	It Provide **Strong** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics
	PO 3 (High)	It Involve **strong** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety
	PO 4 (Medium)	It gives **fair** research-based knowledge and research methods including design of experiments
	PO 5 (Low)	It Provide **basic** research-based knowledge and research methods including design of experiments
	PSO 2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C203 & ELECTROMAGNETIC THEORY

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C203.1	3	3	3	3	2	-	-	-	-	-	-	-	-	3
C203.2	3	3	2	2	2	-	-	-	-	-	-	-	-	3
C203.3	2	3	3	3	2	-	-	-	-	-	-	-	-	3
C203.4	3	3	3	2	2	-	-	-	-	-	-	-	2	3
C203.5	3	3	2	3	2	-	-	-	-	-	-	-	2	3
C293	2.80	3.00	2.60	2.60	2.00	-	-	-	-	-	-	-	2.00	3.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It involves **strong** knowledge in engineering specialization related to the basic concepts of vector calculus and vector algebra
	PO2 (High)	It provides **strong** knowledge in analyzing complex engineering problems through mathematical analysis in solving vector calculus problems
	PO3 (High)	It provides **strong** idea about applying the knowledge of mathematics in finding out the electric field intensity of line charge, circular disc
	PO4 (High)	It involves analysis of **strong** knowledge in investigating the complex problems with respect to Electrostatic Gauss Law
	PO5(Medium)	It involves **fair** ideas in designing the complex problems modelling the different coordinate systems
	PSO 2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It provides **strong** idea about applying the knowledge of mathematics in clear understanding the concepts of electrical potential and boundary conditions in electrostatics
	PO2 (High)	It involves **strong** knowledge in identifying the complex engineering problems for finding out the electric potential in line charge, surface and volume charge
	PO3 (Medium)	It involves **fair** ideas in developing the solutions for complex problems in solving Laplace and Poisson's equation
	PO4(Medium)	It involves **fair** ideas in understanding the concepts of analyzing the data for solving the capacitance in various circumstances
	PO5(Medium)	It involves **fair** ideas in applying the techniques for finding out the

		energy density
	PSO 2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (Medium)	It involves **fair** ideas in applying the mathematical knowledge for finding out the magnetic field intensity of circular loop, straight conductor, infinite sheet of current.
	PO2 (High)	It provides **strong** ideas in identifying the engineering problems for developing the basic concepts of Magnetostatics and its boundary conditions
	PO3 (High)	It involves **strong** knowledge in engineering for developing solutions in finding out magnetic field intensity for torque, magnetic force, Inductance.
	PO4 (High)	It involves **strong** knowledge in investigating the complex problems under the concepts of scalar and vector potential
	PO5 (Medium)	It involves **fair** ideas in understanding the concepts in applying the techniques for various magnetostatic applications
	PSO 2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It involves **strong** knowledge in engineering specialization related to the basic concepts of Maxwells equations using basic laws
	PO2 (High)	It involves **strong** knowledge in analyzing the engineering problems for solving maxwells equations
	PO3 (High)	It involves **strong** knowledge in engineering for developing solutions in finding out displacement current concept.
	PO4(Medium)	It involves **fair** ideas in understanding the concepts and investigating the complex problems for solving maxwells equations
	PO5(Medium)	It involves **fair** ideas in understanding the concepts and in applying the techniques for the relation between circuit theory and field theory
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It involves **strong** knowledge in engineering specialization related to the basic concepts of electromagnetic wave equations
	PO2 (High)	It provides **strong** ideas in identifying the engineering problems for developing the basic concepts of EM waves and its parameters
	PO3 (Medium)	It involves **strong** knowledge in engineering for developing solutions in finding out EM waves in free space, lossy and lossless dielectrics
	PO4 (High)	It involves **strong** knowledge in investigating the complex problems under the concepts of poynting vector and developing poynting theorem

	PO5 (Medium)	It involves **fair** ideas in understanding the concepts in applying the techniques for plane wave reflection and refraction
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C204 & ELECTRICAL MACHINES – I

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C204.1	3	2	3	2	-	-	-	-	-	-	-	-	-	3
C204.2	3	3	3	3	-	-	-	-	-	-	-	2	2	3
C204.3	3	3	2	3	-	-	-	-	-	-	-	-	2	3
C204.4	3	3	3	3	-	-	-	-	-	-	-	-	-	3
C204.5	3	3	3	2	-	-	-	-	-	-	-	-	-	3
C204	3.00	2.80	2.80	2.60	-	-	-	-	-	-	-	2.00	2.00	3.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It involves **strong** theory in science and mathematics related to Electromagnetic circuits
	PO2 (Medium)	It provides **fair** idea in first principles of mathematics, science, and engineering sciences related to fundamentals of magnetic material and analysis.
	PO3 (High)	It involves providing **strong** idea in finding solution to complex problems (magnetic losses) related to magnetic circuits.
	PO4 (Medium)	It involves only **fair** knowledge to provide valid conclusions for investigating complex problems in magnetic circuits using research-based knowledge and research methods
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It involves **strong** theory in science and mathematics related to performance analysis of Equivalent circuit of transformer
	PO2 (High)	It involves **strong** in literature review and analysis of complex problems in transformer under different loading conditions

	PO3 (High)	It involves **strong** in Design and develop solutions of various types of transformers
	PO4 (High)	It involves **strong** analysis in voltage regulation and efficiency analysis of transformer
	PO12(Medium)	It involves **fair** in knowledge and understanding project management in transformer
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It involves **strong** knowledge of mathematics and engineering fundamentals for Interpretation of the electric and magnetic field interactions in electromechanical devices.
	PO2 (High)	It involves **strong** formulation and literature review for concepts and principle of electro mechanical devices
	PO3 (Medium)	It has **fair** design solution, public and environment consideration while placing various of electro mechanical devices.
	PO4 (High)	It involves **strong** in literature review and analysis of complex problems in electrical machines
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It has a **strong** engineering fundamentals, specification and solutions to analyze the concepts and principles of dc machines.
	PO2 (High)	It involves **strong** formulation and literature review for concepts and principle of various excitations.
	PO3 (High)	It involves **strong** design solutions , public, and environmental consideration while placing various types of dc machines
	PO4 (High)	It involves **strong** in literature review and analysis of complex problems in excitation
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It involves **strong** theory in science and mathematics for Understanding the concepts of performances of dc motor
	PO2 (High)	It involves **strong** formulation and literature review for concepts and principle of various speed control methods of dc motor.
	PO3 (High)	It involves **strong** design solutions , public, and environmental consideration while placing various types of starting methods of dc motor
	PO4 (Medium)	It involves **fair** research based knowledge in protection scheme for

		various types of testing for dc motor
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C205 & ELECTRON DEVICES AND CIRCUITS

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C205.1	3	2	3	2	-	-	-	-	-	-	-	-	-	2
C205.2	2	3	2	2	-	-	-	-	-	-	-	-	-	2
C205.3	2	3	3	-	-	-	-	-	-	-	-	-	1	2
C205.4	2	3	-	2	-	-	-	-	-	-	-	-	2	2
C205.5	3	3	-	2	-	-	-	-	-	-	-	-	1	2
C205	2.40	2.80	2.67	2.00	-	-	-	-	-	-	-	-	1.33	2.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It describes the **Strong** basic knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It provides **fair** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics.
	PO3 (High)	It explains **Strong** 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.
	PO4 (Medium)	It deals **fair** 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.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (Medium)	It describes the **fair** basic knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** analyze complex engineering problems reaching

		substantiated conclusions using first principles of mathematics.
	PO3 (Medium)	It explains **fair** 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.
	PO4 (Medium)	It deals **fair** 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.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (Medium)	It describes the **fair** basic knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics.
	PO3 (High)	It explains **strong** 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.
	PSO1(Low)	It provides **basic** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (Medium)	It describes the **fair** basic knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics.
	PO4 (Medium)	It deals **fair** 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.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It describes the **strong** basic knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics.
	PO4 (Medium)	It deals **fair** 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.
	PSO1(Low)	It provides **basic** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C206 & POWER PLANT ENGINEERING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C206.1	3	3	3	2	-	-	-	-	-	-	-	2	2	2
C206.2	3	3	2	-	-	-	3	-	-	-	-	2	-	2
C206.3	3	3	3	3	-	-	-	-	-	-	-	3	2	2
C206.4	3	3	3	2	2	3	3	3	-	-	-	3	-	2
C206.5	3	2	2	2	-	-	-	-	-	-	-	3	2	2
C206	3.00	2.80	2.60	2.25	2.00	3.00	3.00	3.00	-	-	-	2.60	2.00	2.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	**Strongly** mapped as students understand basics coal based thermal power plants concepts clearly.
	PO2 (High)	**Strongly** mapped as students know how to explain the various steam handling systems and types of fans and boilers used in steam power plant
	PO3 (High)	**Strongly** mapped as students are able to design and develop solutions for thermodynamic cycles.
	PO4(Medium)	**Fair** mapped as students use their knowledge to design various complex problems.
	PO12(Medium)	It provides **fair** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2(Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy

		industries with ethical standards.
CO2	PO1 (High)	**Strongly** mapped as the students able to know about the types of turbines, cycles and the methods to improve the performance of power plants.
	PO2 (High)	**Strongly** mapped as students are interested in problem solving as it deals with the performance and efficiency of power plant.
	PO3 (Medium)	**Fair** mapped as students are able to design diesel and gas turbine power plants.
	PO7(High)	It gives **strong** impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
	PO12(Medium)	It provides **fair** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2(Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	**Strongly** mapped as students are able to understand the principle of nuclear power plant and various reactor types.
	PO2 (High)	**Strongly** mapped as students acquire ability to analyze the sub systems and working of nuclear reactors.
	PO3 (High)	**Strongly** mapped as students develop skills for providing solution to complex problems related to safety measures of nuclear power plants.
	PO4(High)	**Strongly** mapped as students can investigate complex problems related to nuclear power plants.
	PO5(Medium)	**Fair** mapped as students can apply appropriate technique to solve complex problems.
	PO12(High)	It provides **strong** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2(Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	**Strongly** mapped as students gain knowledge about the principle and the working of hydro power plant, dams and different hydro power plant.
	PO2 (High)	**Strongly** mapped as students acquire ability to analyze the design of wind turbines, solar cells, tidal power plants, etc.,
	PO3 (High)	**Strongly mapped** as it involves providing idea in finding solution to complex problems.
	PO4 (Medium)	**Fair** mapped as students learnt to utilize their knowledge to solve complex problems related to pumps and turbines.

	PO5(Medium)	**Fair** mapped as students can apply appropriate technique to solve complex problems.
	PO6(High)	It provides **strong** 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.
	PO7(High)	It gives **strong** impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
	PO8(High)	It gives **strong** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO12(High)	It provides **strong** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2(Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	**Strongly** mapped as students are able to understand the concept of different types of power plants, students able to know the functions of power plants and issues related to them which relate the analysis in power sectors.
	PO2 (Medium)	**Fair** mapped as students learn to analyze power tariffs, load distribution and pollution control technologies.
	PO3 (Medium)	**Fair** mapped as it involves providing idea in finding solution to complex problems related to real time applications.
	PO4 (Medium)	**Fair** mapped as students investigate environmental issues related to power plants.
	PO12(High)	It provides **strong** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2(Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C207 & ELECTRONICS LABORATORY													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C207.1	**3**	**3**	**3**	**-**	**3**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**3**	**3**
C207.2	**3**	**3**	**3**	**-**	**2**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**3**	**3**
C207.3	**3**	**3**	**3**	**-**	**2**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**3**	**3**
C207.4	**3**	**3**	**3**	**-**	**2**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**3**	**3**
C207.5	**3**	**3**	**3**	**-**	**2**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**3**	**3**
C207	**3.00**	**3.00**	**3.00**	**-**	**2.20**	**-**	**-**	**-**	**2.00**	**2.00**	**-**	**-**	**3.00**	**3.00**

Course Outcome Number	Mapped with POs	Justification
CO 1	PO1 (High)	It describes the **Strong** basic knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** valuable analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It explains **Strong** complex engineering problems and design system components or processes that meet the specified needs.
	PO5 (High)	It gives **Strong** apply appropriate techniques, resources, and modern engineering and IT tools including prediction
	PO9 (Medium)	It gives **fair** an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It deals **strong** complex engineering activities with the engineering community and with society at large.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It describes the **Strong** basic knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** valuable analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

	PO3 (High)	It explains **Strong** complex engineering problems and design system components or processes that meet the specified needs.
	PO5 (Medium)	It gives **fair** apply appropriate techniques, resources, and modern engineering and IT tools including prediction
	PO9 (Medium)	It gives **fair** an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (Medium)	It deals **fair** complex engineering activities with the engineering community and with society at large.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It describes the **Strong** basic knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** valuable analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It explains **Strong** complex engineering problems and design system components or processes that meet the specified needs.
	PO5 (Medium)	It gives **fair** apply appropriate techniques, resources, and modern engineering and IT tools including prediction
	PO9 (Medium)	It gives **fair** an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (Medium)	It deals **fair** complex engineering activities with the engineering community and with society at large.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It describes the **Strong** basic knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** valuable analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It explains **Strong** complex engineering problems and design system components or processes that meet the specified needs.
	PO5 (Medium)	It gives **fair** apply appropriate techniques, resources, and modern engineering and IT tools including prediction
	PO9 (Medium)	It gives **fair** an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

	PO10 (Medium)	It deals **fair** complex engineering activities with the engineering community and with society at large.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It describes the **Strong** basic knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** valuable analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It explains **Strong** complex engineering problems and design system components or processes that meet the specified needs.
	PO5 (Medium)	It gives **fair** apply appropriate techniques, resources, and modern engineering and IT tools including prediction
	PO9 (Medium)	It gives **fair** an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (Medium)	It deals **fair** complex engineering activities with the engineering community and with society at large.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C208 & ELECTRICAL MACHINES LABORATORY – I														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C208.1	**3**	**3**	**3**	**2**	**2**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**1**	**3**
C208.2	**3**	**3**	**3**	**2**	**2**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**1**	**3**
C208.3	**3**	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**1**	**3**
C208.4	**3**	**3**	**3**	**3**	**2**	**3**	**-**	**-**	**2**	**2**	**-**	**-**	**1**	**3**
C208.5	**3**	**3**	**1**	**1**	**2**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**1**	**3**
C208	**3.00**	**3.00**	**2.40**	**2.00**	**2.00**	**3.00**	**-**	**-**	**2.00**	**2.00**	**-**	**-**	**1.00**	**3.00**

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It describes the **Strong basic** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It explains **Strong** complex engineering problems and design system components or processes that meet the specified needs.
	PO4 (Medium)	It involve **fair** research-based knowledge and research methods including design of experiments
	PO5 (Medium)	It gives **fair** apply appropriate techniques, resources, and modern engineering and IT tools including prediction
	PO9 (Medium)	It gives **fair** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives Strong apply appropriate techniques, resources, and modern engineering and IT tools including prediction
	PSO1(Low)	It provides **basic** modern tools and provides solutions for the real time problems related to energy conservation.

	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It describes the **Strong basic** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It explains **Strong** complex engineering problems and design system components or processes that meet the specified needs.
	PO4 (Medium)	It involve **fair** research-based knowledge and research methods including design of experiments
	PO5 (Medium)	It gives **fair** apply appropriate techniques, resources, and modern engineering and IT tools including prediction
	PO9 (Medium)	It gives **fair** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (Medium)	It gives **fair** apply appropriate techniques, resources, and modern engineering and IT tools including prediction
	PSO1(Low)	It provides **basic** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It describes the **Strong basic** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (Medium)	It explains **fair** complex engineering problems and design system components or processes that meet the specified needs.
	PO4 (Medium)	It involve **fair** research-based knowledge and research methods including design of experiments

	PO5 (Medium)	It gives **fair** apply appropriate techniques, resources, and modern engineering and IT tools including prediction
	PO9 (Medium)	It gives **fair** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **Strong** apply appropriate techniques, resources, and modern engineering and IT tools including prediction
	PSO1(Low)	It provides **basic** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It describes the **Strong basic** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It explains **Strong** complex engineering problems and design system components or processes that meet the specified needs.
	PO4 (High)	It involve **strong** research-based knowledge and research methods including design of experiments
	PO5 (Medium)	It gives **fair** apply appropriate techniques, resources, and modern engineering and IT tools including prediction
	PO6 (High)	It provides **strong** 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.
	PO9 (Medium)	It gives **fair** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (Medium)	It gives **fair** apply appropriate techniques, resources, and modern engineering and IT tools including prediction
	PSO1(Low)	It provides **basic** modern tools and provides solutions for the real time problems related to energy conservation.

	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It describes the **Strong basic** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (Low)	It explains **basic** complex engineering problems and design system components or processes that meet the specified needs.
	PO4 (Low)	It involve **basic** research-based knowledge and research methods including design of experiments
	PO5 (Medium)	It gives **fair** apply appropriate techniques, resources, and modern engineering and IT tools including prediction
	PO9 (Medium)	It gives **fair** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (Medium)	It gives **Strong** apply appropriate techniques, resources, and modern engineering and IT tools including prediction
	PSO1(Low)	It provides **basic** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C209 & NUMERICAL METHODS													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C209.1	**3**	**3**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**
C209.2	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**2**
C209.3	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**2**
C209.4	**3**	**3**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**2**
C209.5	**3**	**3**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**2**	**2**
C209	**3.00**	**3.00**	**1.00**	**-**	**2.33**	**-**	**-**	**-**	**-**	**-**	**-**	**2.25**	**2.00**	**2.00**

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It involves **strong** theory in science and mathematics related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO5 (Medium)	It implicates **fair** idea in applying modern engineering and IT tools related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It involves **strong** theory in science and mathematics related to apply the numerical techniques of interpolation and error approximations in various intervals in real life situations.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to apply the numerical techniques of interpolation and error approximations in various intervals in real life situations.

	PO12 (Medium)	It implicate **fair** idea to engage in independent and life-long learning related to apply the numerical techniques of interpolation and error approximations in various intervals in real life situations.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It involves **strong** theory in science and mathematics related to apply the engineering knowledge to solve the differentiation and integration problems.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to apply the engineering knowledge to solve the differentiation and integration problems.
	PO12(Medium)	It implicates **fair** idea to engage in independent and life-long learning related to apply the engineering knowledge to solve the differentiation and integration problems.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It involves **strong** theory in science and mathematics related to identify and apply the modern tools for solving first and second order ordinary differential equations.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to identify and apply the modern tools for solving first and second order ordinary differential equations.
	PO3 (low)	It provides **basic** theory providing solutions for complex engineering problems related to identify and apply the modern tools for solving first and second order ordinary differential equations.
	PO5 (High)	It implicates **strong** idea in applying modern engineering and IT tools related to identify and apply the modern tools for solving first and second order ordinary differential equations.
	PO12 (Medium)	It implicates **fair** idea to engage in independent and life-long learning related to identify and apply the modern tools for solving first and second order ordinary differential equations.

	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It involves **strong** theory in science and mathematics related to identify the problem and solve the partial and ordinary differential equations with initial and boundary conditions by using modern tools for project management.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to identify the problem and solve the partial and ordinary differential equations with initial and boundary conditions by using modern tools for project management.
	PO5 (Medium)	It implicates **fair** idea in applying modern engineering and IT tools related to identify the problem and solve the partial and ordinary differential equations with initial and boundary conditions by using modern tools for project management.
	PO12 (High)	It implicates **strong** idea to engage in independent and life-long learning related to identify the problem and solve the partial and ordinary differential equations with initial and boundary conditions by using modern tools for project management.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C210 & ELECTRICAL MACHINES – II													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C210.1	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**
C210.2	**3**	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**
C210.3	**3**	**3**	**3**	**3**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
C210.4	**3**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
C210.5	**3**	**3**	**3**	**2**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
C210	**3.00**	**3.00**	**2.80**	**2.40**	**-**	**-**	**1.00**	**-**	**-**	**-**	**-**	**-**	**2.00**	**2.00**

Course Outcome Number	**Mapped with POs**	**Justification**
CO1	PO1 (High)	It involves **strong** theory in science and mathematics related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO3 (High)	It provide **strong** solutions for complex engineering problems and design system components
	PO4 (Medium)	It gives **fair** Use research-based knowledge and research methods including design of experiments
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It involves **strong** theory in science and mathematics related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to apply the fundamental techniques of solving algebraic and

		transcendental equations.
	PO3 (High)	It provide **strong** solutions for complex engineering problems and design system components
	PO4 (High)	It gives **fair** Use research-based knowledge and research methods including design of experiments
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It involves **strong** theory in science and mathematics related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO3 (High)	It provide **strong** solutions for complex engineering problems and design system components
	PO4 (High)	It gives **strong** Use research-based knowledge and research methods including design of experiments
	PO7 (Low)	It implicates **fair** idea the impact of the professional engineering solutions in societal and environmental contexts.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It involves **strong** theory in science and mathematics related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO3 (Medium)	It provide **fair** solutions for complex engineering problems and design system components

	PO4 (Medium)	It gives **fair** Use research-based knowledge and research methods including design of experiments
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It involves **strong** theory in science and mathematics related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO3 (High)	It provide **strong** solutions for complex engineering problems and design system components
	PO4 (Medium)	It gives **fair** Use research-based knowledge and research methods including design of experiments
	PO7 (Low)	It implicates **fair** idea the impact of the professional engineering solutions in societal and environmental contexts.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C211 & TRANSMISSION AND DISTRIBUTION													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C211.1	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**1**	**2**	**3**	**-**	**2**	**2**
C211.2	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**1**	**2**	**3**	**-**	**2**	**2**
C211.3	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**1**	**2**	**3**	**-**	**-**	**2**
C211.4	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**1**	**1**	**2**	**3**	**-**	**-**	**2**
C211.5	**3**	**3**	**2**	**-**	**2**	**-**	**-**	**1**	**1**	**2**	**3**	**-**	**-**	**2**
C211	**3.00**	**3.00**	**2.80**	**2.00**	**2.00**	**-**	**-**	**1.00**	**1.00**	**2.00**	**3.00**	**-**	**2.00**	**2.00**

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It involves **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It implicates **fair** 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.
	PO4 (Medium)	It provides **fair** knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
	PO9 (Low)	It provides **basic** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (Medium)	It implicates **fair** effectively on complex engineering activities with the engineering community and with society at large.
	PO11 (High)	It involves **strong** knowledge and understanding of the engineering and management principles and apply these to one's own work.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.

	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It involves **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It implicates **fair** 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.
	PO4 (Medium)	It provides **fair** knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
	PO9 (Low)	It provides **basic** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (Medium)	It implicates **fair** effectively on complex engineering activities with the engineering community and with society at large.
	PO11 (High)	It involves **strong** knowledge and understanding of the engineering and management principles and apply these to one's own work.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It involves **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It implicates **fair** 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.
	PO4 (Medium)	It provides **fair** knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions

	PO9 (Low)	It provides **basic** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (Medium)	It implicates **fair** effectively on complex engineering activities with the engineering community and with society at large.
	PO11 (High)	It involves **strong** knowledge and understanding of the engineering and management principles and apply these to one's own work.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It involves **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It implicates **fair** 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.
	PO4 (Medium)	It provides **fair** knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
	PO8 (Low)	It provides **basic** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (Low)	It provides **basic** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (Medium)	It implicates **fair** effectively on complex engineering activities with the engineering community and with society at large.
	PO11 (High)	It involves **strong** knowledge and understanding of the engineering and management principles and apply these to one's own work.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It involves **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

	PO2 (High)	It provides **strong** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It implicates **fair** 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.
	PO4 (Medium)	It provides **fair** knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
	PO8 (Low)	It provides **basic** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (Low)	It provides **basic** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (Medium)	It implicates **fair** effectively on complex engineering activities with the engineering community and with society at large.
	PO11 (High)	It involves **strong** knowledge and understanding of the engineering and management principles and apply these to one's own work.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C212 & MEASUREMENTS AND INSTRUMENTATION														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C212.1	**3**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
C212.2	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
C212.3	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
C212.4	**3**	**3**	**3**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
C212.5	**3**	**3**	**2**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**
C212	**3.00**	**2.80**	**2.40**	**2.33**	**3.00**	**2.00**	**-**	**-**	**-**	**-**	**-**	**-**	**2.00**	**2.00**

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It involves **strong** knowledge on functional elements of instruments and errors in measurement system.
	PO2 (High)	It **strongly** Identifies and formulate Instrumentation Engineering problems and analyze the problem using Mathematics and Engineering Sciences.
	PO3 (Medium)	It involves **fair** idea which comes out with solutions for the complex problems and to design system components of instrumentation and measuring system
	PO4 (Medium)	It has **fair** knowledge acquisition from research and interpretation of data on functional elements and errors related with the system.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It involves **strong** basics science and engineering for measuring electrical and electronics parameters
	PO2 (High)	It **strongly** analyze the problem using Engineering Sciences for measuring electrical and electronics parameters.
	PO3 (High)	It involves **strong** design system components for measuring electrical and electronics parameters that 115ulfil the particular needs taking into account of public and environmental issues.

	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It involves **strong** theory in science and mathematics related to Design suitable bridge circuit used for measuring different electrical quantities.
	PO2 (Medium)	It has a **fair** identification and formulization of Instrumentation Engineering problems for measuring different electrical quantities.
	PO3 (Medium)	It involves **fair** design solutions system design components and circuits used for measuring different electrical quantities.
	PO4 (Medium)	It involves **fair** analysis and interpretation of data Used for measuring different parameters.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It involves **strong** knowledge of mathematics , engineering for the construction, operating principles of different storage and display devices
	PO2 (High)	It has **strong** identification and formulation required for operating different storage and display devices.
	PO3 (High)	It has **strong** system component design with appropriate concern for the public while applying concepts for construction of different storage devices.
	PO6(Medium)	It gives **fair** 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.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It has a **strong** concepts and operational features of transducer and Data Acquisition System.
	PO2 (High)	It involves **strong** formulation and substantiated conclusion while acquiring data for the process of transducer.
	PO3 (Medium)	It has **fair** design solution , cultural, societal and environment consideration while applying the concepts and features of

		various transducers
	PO4 (High)	It **strongly** uses research based knowledge ,methods and interpretation in data acquisition systems
	PO 5(High)	It involves **strong** usage of modern for the data acquisition system and identifying features to operate transducers.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C213 & LINEAR INTEGRATED CIRCUITS AND APPLICATIONS														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C213.1	**3**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**2**
C213.2	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
C213.3	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
C213.4	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
C213.5	**3**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**
C213	**3.00**	**2.60**	**2.20**	**2.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.50**	**2.00**

Course Outcome Number	**Mapped with POs**	**Justification**
CO1	PO1 (High)	**Strongly** mapped as students understand basics of integrated circuits, classifications of ICs and its fabrication process.
	PO2 (High)	**Strongly** mapped as students realised monolithic ICs and packaging.

	PO3 (Medium)	**Fairly** mapped as students gain knowledge of fabrication of complex circuits using monolithic IC technology.
	PO4(Medium)	**Fairly** mapped as students use their knowledge to design various complex circuits.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	**Strongly** mapped as students learn the basics of fabrication of passive elements
	PO2 (Medium)	**Fairly** mapped as students are able to analyze the fabrication process of resistor, capacitor, FETs and PV cells.
	PO3 (Medium)	**Fairly** mapped as students are able to design different types of circuits using the learnt technologies.
	PO4(Medium)	**Fairly** mapped as students use their knowledge to design complex circuits.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	**Strongly** mapped as students gain basic knowledge of the ideal, AC & DC characteristics of an Op-amp.
	PO2 (High)	**Strongly** mapped as students acquire ability to analyze the characteristics of practical Op-Amp, difference between ideal and practical op-amp, change of their characteristics with various factors.
	PO3 (High)	**Strongly** mapped as students develop skills for providing solution to complex problems related to V/I & I/V converters, integrators and differentiators.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	**Strongly** mapped as students enhance their knowledge towards the applications of Op-amps.
	PO2 (Medium)	**Fairly** mapped as students acquire ability to analyze real time applications such as filter circuits, multivibrators, waveform generators, A/D converters and D/A converters.

	PO3 (Medium)	**Fairly** mapped as it involves providing idea in finding solution to complex problems related to multivibrators, PWM, wave form generator circuits.
	PO4 (Medium)	**Fairly** mapped as students learnt to utilize their knowledge to develop various real time applications using operational amplifiers.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	**Strongly** mapped as students come to know the basics of some special ICs like 555 timer IC,IC565-PLL,IC566-VCO.
	PO2 (High)	**Strongly** mapped as students learn to analyze and derive the output expressions for monostable multivibrators, astable multivibrators, RC phase shift Oscillators, Wein bridge oscillators.
	PO3 (Medium)	**Fairly** mapped as it involves providing idea in finding solution to complex problems related to real time applications.
	PO4 (Medium)	**Fairly** mapped as students are capable to design circuits using Pulse width modulation, Frequency modulation, Frequency divider, Frequency shift keying, techniques.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C214 & CONTROL SYSTEMS

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C214.1	3	2	2	-	-	-	-	-	-	-	-	-	-	2
C214.2	3	3	2	2	-	-	-	-	-	-	-	-	-	2
C214.3	3	3	3	2	2	-	-	-	-	-	-	-	2	2
C214.4	3	3	3	2	2	-	-	-	-	-	-	-	2	2
C214.5	3	2	2	-	2	-	-	-	-	-	-	-	2	2
C214	3.00	2.60	2.40	2.00	2.00	-	-	-	-	-	-	-	2.00	2.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It involves **strong** knowledge in engineering specialization related to the basic elements of control systems, the difference between open loop and closed loop systems.
	PO2 (Medium)	It provides **fair** knowledge in analyzing complex engineering problems through mathematical analysis in solving the electrical analogy of mechanical and thermal systems.
	PO3 (Medium)	It provides **fair** idea about applying the knowledge of mathematics in finding out the signal flow graph technique
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It provides **strong** idea about applying the knowledge of mathematics in clear understanding the time response analysis
	PO2 (High)	It involves **strong** knowledge in identifying the complex engineering problems for finding out the first and second order systems.
	PO3 (Medium)	It involves **fair** ideas in developing the solutions for complex problems in solving root locus analysis
	PO4 (Medium)	It involves **fair** ideas in understanding the concepts of analyzing the data for solving the P,PI and PID controllers
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

CO3	PO1 (High)	It provides **strong** idea about applying the knowledge of mathematics in clear understanding the concepts of frequency response
	PO2 (High)	It involves **strong** knowledge in identifying the complex engineering problems for finding out the closed loop response from open loop response
	PO3 (High)	It involves **strong** ideas in developing the solutions for complex problems in solving bode plot and polar plot
	PO4 (Medium)	It involves **fair** ideas in understanding the concepts of analyzing the data for determining the frequency domain and time domain specifications
	PO5 (Medium)	It involves **fair** ideas in applying the techniques for finding out frequency response
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It provides **strong** idea about applying the knowledge of mathematics in solving the characteristic equation for stability analysis
	PO2 (High)	It involves **strong** knowledge in identifying the complex engineering problems for analysis of Routh Hurwitz criterion
	PO3 (High)	It involves **strong** ideas in developing the solutions for complex problems and designing lag, lead and lag lead compensators using bode plot
	PO4 (Medium)	It involves **fair** ideas in understanding the concepts of analyzing the data for determining Nyquist stability criterion
	PO5 (Medium)	It involves **fair** ideas in applying the techniques for finding out the effect of all compensators
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It provides **strong** idea about applying the knowledge of mathematics in understanding the concept of solving state variables

	PO2 (Medium)	It involves **moderate** knowledge in identifying the complex engineering problems for analysis of state model for linear and time invariant systems
	PO3 (Medium)	It involves **moderate** ideas in developing the solutions for complex problems for state and output equation in controllable canonical form
	PO5 (Medium)	It involves **fair** ideas in applying the techniques for finding out the controllability and observability
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C215 & ELECTRICAL MACHINES LABORATORY - II													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C215.1	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**2**	**3**
C215.2	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**2**	**3**
C215.3	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**2**	**3**
C215.4	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**2**	**3**
C215.5	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**2**	**3**
C215	**3.00**	**3.00**	**3.00**	**2.00**	**-**	**-**	**-**	**-**	**2.00**	**2.00**	**-**	**-**	**2.00**	**3.00**

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It involves **strong** theory in science and mathematics related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO3 (High)	It gives **strong** solutions for complex engineering problems and design system component
	PO4 (Medium)	It gives **fair** research-based knowledge and research methods including design of experiments
	PO9 (Medium)	It gives **fair** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
	PO10 (High)	It involve **Strong** effectively on complex engineering activities with the engineering community and with society at large
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

CO2	PO1 (High)	It involves **strong** theory in science and mathematics related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO3 (High)	It gives **strong** solutions for complex engineering problems and design system component
	PO4 (Medium)	It gives **fair** research-based knowledge and research methods including design of experiments
	PO9 (Medium)	It gives **fair** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
	PO10 (Medium)	It involve **fair** effectively on complex engineering activities with the engineering community and with society at large
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It involves **strong** theory in science and mathematics related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO3 (High)	It gives **strong** solutions for complex engineering problems and design system component
	PO4 (Medium)	It gives **fair** research-based knowledge and research methods including design of experiments
	PO9 (Medium)	It gives **fair** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
	PO10 (Medium)	It involve **fair** effectively on complex engineering activities with the engineering community and with society at large

	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It involves **strong** theory in science and mathematics related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO3 (High)	It gives **strong** solutions for complex engineering problems and design system component
	PO4 (Medium)	It gives **fair** research-based knowledge and research methods including design of experiments
	PO9 (Medium)	It gives **fair** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
	PO10 (Medium)	It involve **fair** effectively on complex engineering activities with the engineering community and with society at large
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It involves **strong** theory in science and mathematics related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to apply the fundamental techniques of solving algebraic and transcendental equations.
	PO3 (High)	It gives **strong** solutions for complex engineering problems and design system component
	PO4 (Medium)	It gives **fair** research-based knowledge and research methods including design of experiments

	PO9 (Medium)	It gives **fair** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
	PO10 (Medium)	It involve **fair** effectively on complex engineering activities with the engineering community and with society at large
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C216 & LINEAR AND DIGITAL INTEGRATED CIRCUITS LABORATORY

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C216.1	3	3	3	-	2	-	-	-	2	2	-	-	2	3
C216.2	3	3	3	-	2	-	-	-	2	2	-	-	2	3
C216.3	3	3	3	2	2	-	-	-	2	2	-	-	2	3
C216.4	3	3	3	-	2	-	-	-	2	2	-	-	2	3
C216.5	3	3	3	-	2	-	-	-	2	2	-	-	2	3
C216	3.00	3.00	3.00	2.00	2.00	-	-	-	2.00	2.00	-	-	2.00	3.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	**Strongly** mapped as students are able to understand the concept of basic gates, boolean functions and combinational circuits
	PO2 (High)	**Strongly** mapped as students are able to analyze combinational logical circuits using truth table and K-Map.
	PO3 (High)	**Strongly** mapped as students are able to understand the combinational logic circuits and able to implement in real time applications.
	PO5 (Medium)	**Fairly** mapped as students are able to select an appropriate logic circuit for the particular application.

	PO9 (Medium)	**Fairly** mapped as students will be able to function effectively as an individual and in a team to accomplish the given task.
	PO10 (Medium)	**Fairly** mapped as students will be able to give clear design documentation.
	PSO1(Medium)	It provides **Fairly** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	**Strongly** mapped as students learn to convert Excess-3 to BCD and Binary to Gray.
	PO2 (High)	**Strongly** mapped as students are able to analyze the circuit using truth table and K-Map
	PO3 (High)	**Strongly** mapped as students are able to design code converter circuits using Basic logic gates for different applications.
	PO5 (Medium)	**Fairly** mapped as students use their knowledge to create an code converter for real time applications. .
	PO9 (Medium)	**Fairly** mapped as students can function effectively as an individual and in a team to accomplish the given task.
	PO10 (Medium)	**Fairly** mapped as students are capable to give clear design documentation of code converters.
	PSO1(Medium)	It provides **Fairly** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
C03	PO1 (High)	**Strongly** mapped as students gain basic knowledge of digital ICs like decoders, multiplexers and registers.
	PO2 (High)	**Strongly** mapped as students acquire ability to analyze the logic circuits using Truth table and K-map.
	PO3 (High)	**Strongly** mapped as students develop skills to design decoders, encoders, multiplexers, demultiplexers and shift registers using basic logic gates and Different types of ICs.

	PO4 (Medium)	**Fairly** mapped as student are ready to knowledge and research methods including design of experiments, analysis and interpretation of data.
	PO5 (Medium)	**Fairly** mapped as students are ready meet some of their needs by logical circuits.
	PO9 (Medium)	**Fairly** mapped as students can function effectively as an individual and in a team to accomplish the given task.
	PO10 (Medium)	**Fairly** mapped as students will be able to give clear design documentation.
	PSO1(Medium)	It provides **Fairly** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	**Strongly** mapped as students understand Operational amplifier applications such as inverting & non-inverting amplifiers, comparators, Summers, differentiators and integrators.
	PO2 (High)	**Strongly** mapped as students acquire ability to analyze various applications of Op-amp using IC LM741.
	PO3 (High)	**Strongly** mapped as it involves providing idea of IC741 for wide variety of applications.
	PO5 (Medium)	**Fairly** mapped as students will be able to give various design of IC741 used for many purpose.
	PO9 (Medium)	**Fairly** mapped as students can function effectively as an individual and in a team to accomplish the given task.
	PO10 (Medium)	**Fairly** mapped as students will be able to give clear design documentation.
	PSO1(Medium)	It provides **Fairly** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	**Strongly** mapped as students come to know the basics of some special ICs like 555 timer ICLM317 Voltage regulators, IC566-VCO.

	PO2 (High)	**Strongly** mapped as students learn to analyze and derive the output expressions for monostable multivibrators, astable multivibrators, Voltage controlled oscillators and voltage regulators.
	PO3 (High)	**Strongly** mapped as it involves providing idea in finding solution to complex problems related to real time applications.
	PO5 (Medium)	**Fairly** mapped as students are capable to design circuits using Pulse width modulation, Frequency modulation, Frequency divider, Frequency shift keying, and techniques.
	PO9 (Medium)	**Fairly** mapped as students can function effectively as an individual and in a team to accomplish the given task.
	PO10 (Medium)	**Fairly** mapped as students will be able to give clear design documentation.
	PSO1(Medium)	It provides **fairly** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C217 & TECHNICAL SEMINAR													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C217.1	**3**	**3**	**-**	**3**	**2**	**1**	**-**	**1**	**2**	**2**	**3**	**3**	**3**	**3**
C217.2	**3**	**3**	**-**	**2**	**2**	**2**	**-**	**2**	**2**	**2**	**3**	**3**	**3**	**3**
C217.3	**3**	**3**	**-**	**3**	**3**	**2**	**-**	**2**	**2**	**2**	**3**	**3**	**3**	**3**
C217.4	**3**	**3**	**-**	**3**	**3**	**2**	**-**	**2**	**2**	**2**	**3**	**3**	**3**	**3**
C217.5	**3**	**3**	**-**	**2**	**2**	**1**	**-**	**1**	**3**	**3**	**3**	**3**	**3**	**3**
C217	**3.00**	**3.00**	**-**	**2.60**	**2.40**	**1.60**	**-**	**1.60**	**2.20**	**2.20**	**3.00**	**3.00**	**3.00**	**3.00**

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It involves **strong** theory in science and mathematics related to identify requirements for the real world problems and propose a methodology.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to identify and formulate the problems.
	PO4 (High)	It involves **strong** theory for design of experiments and synthesis of information related to identify requirements for the real world problems and propose a methodology.
	PO5 (Medium)	It provides **fair** idea in applying modern engineering and IT tools related to identify requirements for the real world problems and propose a methodology
	PO6 (Low)	It involves **basic** contextual knowledge to assess societal, health, safety, legal and cultural issues related to identify requirements for the real world problems and propose a methodology
	PO8 (Low)	It involves **basic** commitment of professional ethics and responsibilities related to identify requirements for the real world problems and propose a methodology.
	PO9 (Medium)	It provides **fair** self-confidence for functioning effectively as an individual, and as a member or leader in diverse teams related to identify requirements for the real world problems and propose a methodology

	PO10 (Medium)	It provides **fair** self-confidence to communicate effectively on complex engineering activities related to identify requirements for the real world problems and propose a methodology
	PO11 (High)	It provides **strong** knowledge and understanding of the engineering and management principles related to identify requirements for the real world problems and propose a methodology
	PO12 (High)	It provides **strong** idea to engage in independent and life-long learning related to identify requirements for the real world problems and propose a methodology
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It involves **strong** theory in science and mathematics related to identify requirements for the real world problems and propose a methodology.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to identify and formulate the problems.
	PO4 (High)	It involves **strong** theory for design of experiments and synthesis of information related to identify requirements for the real world problems and propose a methodology.
	PO5 (Medium)	It provides **fair** idea in applying modern engineering and IT tools related to identify requirements for the real world problems and propose a methodology
	PO6 (Low)	It involves **basic** contextual knowledge to assess societal, health, safety, legal and cultural issues related to identify requirements for the real world problems and propose a methodology
	PO8 (Low)	It involves **basic** commitment of professional ethics and responsibilities related to identify requirements for the real world problems and propose a methodology.
	PO9 (Medium)	It provides **fair** self-confidence for functioning effectively as an individual, and as a member or leader in diverse teams related to identify requirements for the real world problems and propose a methodology
	PO10 (Medium)	It provides **fair** self-confidence to communicate effectively on complex engineering activities related to identify requirements for the real world problems and propose a methodology

	PO11 (High)	It provides **strong** knowledge and understanding of the engineering and management principles related to identify requirements for the real world problems and propose a methodology
	PO12 (High)	It provides **strong** idea to engage in independent and life-long learning related to identify requirements for the real world problems and propose a methodology
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It involves **strong** theory in science and mathematics related to identify requirements for the real world problems and propose a methodology.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to identify and formulate the problems.
	PO4 (High)	It involves **strong** theory for design of experiments and synthesis of information related to identify requirements for the real world problems and propose a methodology.
	PO5 (Medium)	It provides **fair** idea in applying modern engineering and IT tools related to identify requirements for the real world problems and propose a methodology
	PO6 (Low)	It involves **basic** contextual knowledge to assess societal, health, safety, legal and cultural issues related to identify requirements for the real world problems and propose a methodology
	PO8 (Low)	It involves **basic** commitment of professional ethics and responsibilities related to identify requirements for the real world problems and propose a methodology.
	PO9 (Medium)	It provides **fair** self-confidence for functioning effectively as an individual, and as a member or leader in diverse teams related to identify requirements for the real world problems and propose a methodology
	PO10 (Medium)	It provides **fair** self-confidence to communicate effectively on complex engineering activities related to identify requirements for the real world problems and propose a methodology
	PO11 (High)	It provides **strong** knowledge and understanding of the engineering and management principles related to identify requirements for the real world problems and propose a methodology

	PO12 (High)	It provides **strong** idea to engage in independent and life-long learning related to identify requirements for the real world problems and propose a methodology
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It involves **strong** theory in science and mathematics related to identify requirements for the real world problems and propose a methodology.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to identify and formulate the problems.
	PO4 (High)	It involves **strong** theory for design of experiments and synthesis of information related to identify requirements for the real world problems and propose a methodology.
	PO5 (Medium)	It provides **fair** idea in applying modern engineering and IT tools related to identify requirements for the real world problems and propose a methodology
	PO6 (Low)	It involves **basic** contextual knowledge to assess societal, health, safety, legal and cultural issues related to identify requirements for the real world problems and propose a methodology
	PO8 (Low)	It involves **basic** commitment of professional ethics and responsibilities related to identify requirements for the real world problems and propose a methodology.
	PO9 (Medium)	It provides **fair** self-confidence for functioning effectively as an individual, and as a member or leader in diverse teams related to identify requirements for the real world problems and propose a methodology
	PO10 (Medium)	It provides **fair** self-confidence to communicate effectively on complex engineering activities related to identify requirements for the real world problems and propose a methodology
	PO11 (High)	It provides **strong** knowledge and understanding of the engineering and management principles related to identify requirements for the real world problems and propose a methodology
	PO12 (High)	It provides **strong** idea to engage in independent and life-long learning related to identify requirements for the real world problems and propose a methodology

	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It involves **strong** theory in science and mathematics related to identify requirements for the real world problems and propose a methodology.
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to identify and formulate the problems.
	PO4 (High)	It involves **strong** theory for design of experiments and synthesis of information related to identify requirements for the real world problems and propose a methodology.
	PO5 (Medium)	It provides **fair** idea in applying modern engineering and IT tools related to identify requirements for the real world problems and propose a methodology
	PO6 (Low)	It involves **basic** contextual knowledge to assess societal, health, safety, legal and cultural issues related to identify requirements for the real world problems and propose a methodology
	PO8 (Low)	It involves **basic** commitment of professional ethics and responsibilities related to identify requirements for the real world problems and propose a methodology.
	PO9 (Medium)	It provides **fair** self-confidence for functioning effectively as an individual, and as a member or leader in diverse teams related to identify requirements for the real world problems and propose a methodology
	PO10 (Medium)	It provides **fair** self-confidence to communicate effectively on complex engineering activities related to identify requirements for the real world problems and propose a methodology
	PO11 (High)	It provides **strong** knowledge and understanding of the engineering and management principles related to identify requirements for the real world problems and propose a methodology
	PO12 (High)	It provides **strong** idea to engage in independent and life-long learning related to identify requirements for the real world problems and propose a methodology
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.

	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C301 & POWER SYSTEM ANALYSIS

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C301.1	3	3	2	2	-	-	-	-	-	-	-	-	-	2
C301.2	3	3	3	3	3	-	-	-	-	-	-	-	2	2
C301.3	3	3	3	3	-	-	-	-	-	-	-	-	-	2
C301.4	3	3	3	3	2	-	-	-	-	-	-	-	2	2
C301.5	3	3	2	2	-	-	-	-	-	-	-	-	-	2
C301	3.00	3.00	2.60	2.60	2.50	-	-	-	-	-	-	-	2.00	2.00

Course Outcome Number	Mapped with POs	Justification
CO 1	PO1 (High)	It involves **strong** engineering fundamentals and specification of components and per unit values under normal operating condition.
	PO2 (High)	It involves **strong** Identifies and formulation of per unit values under steady state operating conditions.
	PO3 (Medium)	It involves **fair** design solutions of power system components and public, cultural environmental consideration.
	PO4 (Medium)	It has a **fair** research based knowledge and methods involved in designing the power system components
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It **strongly** uses knowledge of mathematics and engineering while applying load flow techniques.

	PO2 (High)	It has a **strong** literature review and substantiate conclusion in all load flow techniques.
	PO3 (High)	It involves **strong** design and development of solutions for power flows problems
	PO4 (High)	It has a **strong** knowledge in GS and NR techniques.
	PO5 (High)	It involves **strong** usage of modern tools to solve power flow problems using GS and NR methods
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It involves **strong** knowledge of mathematics and engineering fundamentals for obtaining fault current.
	PO2 (High)	It has a **strong** identification of type of fault from the fault current to come to substantiated conclusion.
	PO3 (High)	It involves **strong** design solutions and public, cultural, societal and environmental consideration while estimation fault.
	PO4 (High)	It involves only **strong** research based knowledge in various theorem and techniques used for estimating fault.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It involves **strong** knowledge of mathematics and engineering to analyze symmetrical components faults such as L-Land L-L-G faults
	PO2 (High)	It has a **strong** identification and formulation required for estimating various types using symmetrical components.
	PO3 (High)	It involves **strong r** design solution, public, cultural, societal and environmental consideration while estimating and classifying various types of fault.
	PO4 (High)	It has a **strong** research based knowledge and interpretation of data for the analysis of L-L and L-L-G fault.

	PO5 (Medium)	It has a **fair** usage of modern tools to evaluate fault current for various types of fault.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It has a **strong** engineering fundamentals, specification and solutions to analyze stability of the power system.
	PO2 (HIgh)	It involves **strong** formulation and literature review for Euler's methods to do stability studies.
	PO3 (Medium)	It has **fair** design solution , cultural, societal and environment consideration while analyzing power system stability using various methods
	PO4 (Medium)	It has **fair** research based knowledge, methods and interpretation in data to carry out power system stability studies while using iterative methods.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C302 & MICROPROCESSORS AND MICROCONTROLLERS

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C302.1	3	3	2	-	-	-	-	-	-	-	-	-	-	2
C302.2	3	3	2	-	3	-	-	-	-	-	-	-	-	2
C302.3	3	3	3	3	-	-	-	-	-	-	-	-	-	2
C302.4	3	3	3	-	-	-	-	-	-	-	-	-	-	2
C302.5	3	3	2	-	2	-	-	-	-	-	-	-	3	2
C302	3.00	3.00	2.40	3.00	2.50	-	-	-	-	-	-	-	3.00	2.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It involves **strong** theoretical knowledge with 8085, 8051 Microprocessors and controllers Addressing modes.
	PO2 (High)	It provides **strong** idea in microprocessors and controllers to solve the solution which occurs in processors.
	PO3 (Medium)	It involves providing **fair** idea in finding solution to program level issues in the 8085 and 8051.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It involves **strong** theoretical knowledge with to know about the interrupt structure and function of 8085 and 8051 at different interrupts.
	PO2 (High)	This outcome involves **strong** idea with to analyze Interrupt structure 8085 & 8051 by complex engineering problems reaching substantiated conclusions.
	PO3 (Medium)	This outcome provides **Fair** idea with Interrupt structure 8085 & 8051 to design solutions for complex engineering problems and design system components or processes.
	PO5 (High)	It involves **strong** knowledge to provide valid conclusions for ability & use of Interrupt structure 8085 & 8051 using modern tool usage.

	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It **Strongly** involved with enhancing the engineering knowledge in the area of different types interfacing ICs and Processor.
	PO2 (High)	This outcome involves **strong** with knowing the importance of Interfacing ICs like 8255, 8279.
	PO3 (High)	It involves **strong with** providing solution to interfacing problems and error occurs when it connects to processors.
	PO4 (High)	It involves **strong** knowledge to provide valid conclusions for investigating complex problems in Interfacing techniques.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It involves **strong** theoretical knowledge with to know about the architecture of microprocessors and microcontrollers.
	PO2 (High)	This outcome **strong** involved with first principles of mathematics, science, and engineering sciences related to operation of processors.
	PO3 (High)	It involves providing **strong** idea in finding solution to complex problems related to microprocessors and controllers at different instruction set.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It involves **strong** theoretical knowledge to know about the different data type instructions and its memory types and addressing modes of 8085 and 8051.
	PO2 (High)	This course outcome provides **strong** idea to analyse the complex engineering problems at assembly language problem.
	PO3 (Medium)	It involves providing **fair** idea in finding solution to complex problems at operational level of processors.
	PO5 (Medium)	It involves **fair** knowledge to provide valid conclusions for ability & use of Interrupt structure 8085 & 8051 using modern tool usage.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.

	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C303 & POWER ELECTRONICS

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C303.1	3	2	2	-	2	-	-	-	-	-	-	-	-	2
C303.2	3	3	3	3	2	-	-	-	-	-	-	-	-	2
C303.3	3	3	3	-	3	-	-	-	-	-	-	-	2	2
C303.4	3	3	3	3	2	-	-	-	-	-	-	-	2	2
C303.5	3	3	2	3	-	-	-	-	-	-	-	-	-	2
C303	3.00	2.80	2.60	3.00	2.25	-	-	-	-	-	-	-	2.00	2.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1(High)	It involves **strongly** apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It provides **fair** formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (Medium)	It involves **fair** 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.
	PO5 (Medium)	It provides **fair** appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

CO2	PO1(High)	It involves **strongly** apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It involves **strong** 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.
	PO4 (High)	It gives **strong** based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
	PO5 (Medium)	It provides **fair** appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1(High)	It involves **strongly** apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strongly** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It involves **strongly** 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.
	PO5 (High)	It provides **strongly** appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.

	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1(High)	It involves **strongly** apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strongly r** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It involves **strongly** 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.
	PO4 (High)	It gives **strongly** based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
	PO5 (Medium)	It provides **fair** appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1(High)	It involves **strongly** apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strongly** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (Medium)	It involves **fair** 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.
	PO4 (High)	It gives **strongly** based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid

		conclusions
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C304 & DIGITAL SIGNAL PROCESSING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C304.1	3	2	2	-	2	-	-	-	-	-	-	-	-	2
C304.2	3	3	2	-	2	-	-	-	-	-	-	-	2	2
C304.3	3	3	3	3	2	-	-	-	-	-	-	-	-	2
C304.4	3	3	3	-	2	-	-	-	-	-	-	-	-	2
C304.5	3	3	2	-	2	-	-	-	-	-	-	-	2	2
C304	3.00	2.80	2.40	3.00	2.00	-	-	-	-	-	-	-	2.00	2.00

Course Outcome Number	Mapped with POs	Justification
CO 1	PO1 (High)	It involves **strong** theoretical knowledge to know the fundamental of fourier transform and DSP processors.
	PO2 (Medium)	It provides **fair** idea to processors to solve the solution which occurs in processors.
	PO3 (Medium)	It involves **fair** providing fair idea to finding solution for complex problems with the help fourier transform.
	PO5 (Medium)	It moderately **fair** involved with by the use of modern usage of tool to acquire knowledge on programmability digital signal processor & quantization effects.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO 2	PO1 (High)	It involves **strong** theoretical knowledge with to to acquire knowledge on Signals and systems & their mathematical representation.

	PO2 (High)	This outcome **strongly** involves Moderate idea with to analyze mathematical representation of signal and system to provide the solutions of complex engineering problems .
	PO3 (Medium)	This outcome **fair** provides Fair idea to Design a system and signals for process the data and to improve its performance
	PO5 (Medium)	It involves **fair** idea to provide valid conclusions for ability & use Signals and systems using modern tool usage.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO 3	PO1 (High)	It **Strongly** involved with to enhance the engineering knowledge in discrete time systems.
	PO2 (High)	This outcome **Strongly** involves moderately with to know the analyze signal and systems.
	PO3 (High)	It involves **Strongly** moderately with Basic understanding about design / development of solutions can be attributed at discrete time systems
	PO4 (High)	It involves **Strongly** knowledge to provide valid conclusions for investigating complex problems in discrete systems.
	PO5(Medium)	This outcome **fair** provides Fair idea to Apply appropriate approach for modern tools usage at discrete systems.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO 4	PO1 (High)	It involves **strong** theoretical knowledge with to know about analyze the transformation techniques & their computation.
	PO2 (High)	This outcome **Strongly** moderately involved with first principles of mathematics, science, and engineering sciences related to operation of transformation techniques.

	PO3 (High)	It involves **Strongly** providing fair idea in computation techniques to solve complex problems related to discrete time system and signals.
	PO5 (Medium)	It involves fair idea to provide in computation techniques for Apply appropriate approach for modern tools.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It involves **strong** theoretical knowledge to know about the different types of filters and their design for digital implementation
	PO2 (High)	This outcome **Strongly** moderately involved with first principles of mathematics, science, and engineering sciences related to operation of transformation techniques.
	PO4 (Medium)	It involves **fair** knowledge to provide valid conclusions for investigating complex problems in discrete systems.
	PO5(Medium)	This outcome **fair** provides Fair idea to Apply appropriate approach for modern tools usage at discrete systems.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

OURSE CODE & NAME : C305 & OBJECT ORIENTED PROGRAMMING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C305.1	3	1	1	1	-	-	-	-	-	-	-	2	1	2
C305.2	3	3	3	2	-	-	-	-	-	-	-	2	1	2
C305.3	3	1	2	2	-	-	-	-	-	-	-	2	1	2
C305.4	3	1	1	2	-	-	-	-	-	-	-	2	1	2
C305.5	3	1	2	3	-	-	-	-	-	-	-	2	1	2
C305	3.00	1.40	1.80	2.00	-	-	-	-	-	-	-	2.00	1.00	2.00

Course Outcome Number	Mapped with POs/PSOs	Justification
CO1	PO1 (High)	It involves **strong** theory in science and technology related to understand the concept and features of object oriented programming using java programs with classes and objects
	PO2 (Low)	It provides **basic** idea in first principles of technology, and engineering sciences related to understand the concept and features of object oriented programming using java programs with classes and objects.
	PO3 (Low)	It involves providing **basic** idea in finding solution to complex problems related to understand the concept and features of object oriented programming using java programs with classes and objects.
	PO4 (Low)	It provides **basic** based knowledge and research methods including design of experiments, analysis and interpretation of data
	PO12(Medium)	It involves **fair** theory for design of experiments and synthesis of information related to understand the concept and features of object oriented programming using java programs with classes and objects.
	PSO1(Low)	It provides **basic** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2(Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It involves **strong** theory in science and mathematics related to create the java program using inheritance, access specifies, abstract classes, interfaces and strings.
	PO2 (High)	It involves **strong** theory with first principles of technology, science, and engineering sciences related to create the java program using inheritance, access specifies, abstract classes, interfaces and strings.

	PO3 (High)	It involves **strong** theory providing solution to complex problems related to create the java program using inheritance, access specifies, abstract classes, interfaces and strings.
	PO4 (Medium)	It involves **fair** theory for design of experiments and synthesis of information related to create the java program using inheritance, access specifies, abstract classes, interfaces and strings.
	PO12(Medium)	It involves **fair** theory for design of experiments and synthesis of information related to create the java program using inheritance, access specifies, abstract classes, interfaces and strings.
	PSO1(Low)	It provides **basic** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2(Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It involves **strong** theory in technical related to use of exceptions and its types, input and output stream.
	PO2 (Low)	It involves **basic** theory with first principles of technology, tools, and engineering related to use of exceptions and its types, input and output stream.
	PO3 (Medium)	It involves **flow** theory providing solution to complex problems related to use of exceptions and its types, input and output stream.
	PO4 (Medium)	It involves **fair** theory for design of experiments and synthesis of information related to use of exceptions and its types , input and output stream.
	PO12(Medium)	It involves **fair** theory for design of experiments and synthesis of information related to use of exceptions and its types , input and output stream.
	PSO1(Low)	It provides **basic** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2(Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It involves **strong** theory in application and tools related to build java applications for multi-threading and its life cycle, generic classes and methods and bounded types.
	PO2 (low)	It involves **basic** theory with first principles of knowledge and engineering sciences related to build java applications for multi-threading and its life cycle, generic classes and methods and bounded types..
	PO3 (low)	It involves **basic** theory providing solution to complex problems related to build java applications for multi-threading and its life cycle, generic classes and methods and bounded types.
	PO4 (Medium)	It involves **fair** theory for design of experiments and synthesis of

		information related to use of exceptions and its types , input and output stream.
	PO12 (Medium)	It involves **fair** theory for design of experiments and synthesis of information related to build java applications for multi-threading and its life cycle, generic classes and methods and bounded types.
	PSO1(Low)	It provides **basic** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2(Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It involves **strong** theory in science and technology related to combine the concept of interactive, graphics programming using swing components such as text fields, text areas, button, check box and menus
	PO2 (low)	It involves **strong** theory with first principles of knowledge and engineering sciences related to combine the concept of interactive, graphics programming using swing components such as text fields, text areas, button, check box and menus.
	PO3 (Medium)	It involves **strong** theory providing solution to complex problems related to combine the concept of interactive, graphics programming using swing components such as text fields, text areas, button, check box and menus.
	PO4 (High)	It involves **strong** theory for design of experiments and synthesis of information related to combine the concept of interactive, graphics programming using swing components such as text fields, text areas, button, check box and menus.
	PO12(Medium)	It involves **fair** theory for design of experiments and synthesis of information related to combine the concept of interactive, graphics programming using swing components such as text fields , text areas, button, check box and menus.
	PSO1(Low)	It provides **basic** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2(Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C306 & BASICS OF BIOMEDICAL INSTRUMENTATION

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C306.1	3	2	2	-	-	-	-	-	-	-	-	-	-	2
C306.2	3	3	2	-	2	-	-	-	-	-	-	-	2	2
C306.3	3	3	3	-	-	-	-	-	-	-	-	-	-	2
C306.4	3	3	2	-	2	-	-	-	-	-	-	-	2	2
C306.5	3	2	2	-	-	-	-	-	-	-	-	-	-	2
C306	3.00	2.60	2.20	-	2.00	-	-	-	-	-	-	-	2.00	2.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It involves **Strongly** powerful knowledge in engineering specialization related to the measurement of two electrodes
	PO2 (Medium)	It provides **fair** knowledge in analyzing complex engineering problems through mathematical analysis for solving the equivalent circuit for measurement of bio potential
	PO3 (Medium)	It provides **fair** reasonable idea about applying the knowledge of mathematics in finding out the recording problems
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It involves **strong** knowledge in engineering specialization of frequency and amplitude ranges of measurement of ECG
	PO2 (High)	It provides **powerful** knowledge in analyzing complex engineering problems through mathematical analysis of Einthoven triangle
	PO3 (Medium)	It provides **reasonable** idea about applying the knowledge in finding out the basics of EEG and EMG system
	PO5(Medium)	It involves **fair** ideas in applying the techniques for finding out various modes of EEG system

	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It involves **powerful** knowledge in engineering specialization related to the bio amplifier
	PO2 (High)	It provides **strong** knowledge in analyzing complex engineering problems through mathematical analysis of impedance matching circuits
	PO3 (High)	It provides **strong** idea about applying the knowledge of mathematics in finding out the band pass filtering technique
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It involves **impressive** knowledge in engineering specialization related to the measurement of non-electrical parameters
	PO2 (High)	It provides **strong** knowledge in analyzing complex engineering problems through mathematical analysis of blood pressure, blood flow and cardiac output measurements
	PO3 (Medium)	It provides **reasonable** idea about applying the knowledge of mathematics in finding out the parameters for various cardiac output measurements
	PO5(Medium)	It involves **fair** ideas in applying the techniques for finding out the blood flow rates.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It involves **powerful** knowledge in engineering specialization about the bio chemical measurement.
	PO2 (Medium)	It provides **moderate** knowledge in analyzing complex engineering problems through mathematical analysis blood gas analyzer and sodium potassium analyzer.
	PO3 (Medium)	It provides **reasonable** idea about applying the knowledge of mathematics in finding out the blood cell counts using blood cell counter.

	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C307 & CONTROL AND INSTRUMENTATION LABORATORY

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C307.1	3	3	3	-	3	-	-	-	2	2	-	-	3	3
C307.2	3	3	3	-	3	-	-	-	2	2	-	-	3	3
C307.3	3	3	3	-	3	-	-	-	2	2	-	-	3	3
C307.4	3	3	3	-	3	-	-	-	2	2	-	-	3	3
C307.5	3	3	3	-	3	-	-	-	2	2	-	-	3	3
C307	3.00	3.00	3.00	-	3.00	-	-	-	2.00	2.00	-	-	3.00	3.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It Provides **Strongly** apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It involved **strongly** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It gives **Strongly** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety
	PO5 (High)	It provides **Strongly** apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
	PO9 (High)	It gives **Strongly f**unction effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

	PO10 (High)	It gives **Strongly c**ommunicate effectively on complex engineering activities with the engineering community
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It Provides Strongly apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It involved **strongly** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It gives **Strongly** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety
	PO5 (High)	It provides **Strongly** apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
	PO9 (High)	It gives **Strongly f**unction effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **Strongly c**ommunicate effectively on complex engineering activities with the engineering community
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It Provides Strongly apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It involved **strongly** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It gives **Strongly** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety

	PO5 (High)	It provides **Strongly** apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
	PO9 (High)	It gives **Strongly f**unction effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **Strongly c**ommunicate effectively on complex engineering activities with the engineering community
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It Provides **Strongly** apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It involved **strongly** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It gives **Strongly** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety
	PO5 (High)	It provides **Strongly** apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
	PO9 (High)	It gives **Strongly f**unction effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **Strongly c**ommunicate effectively on complex engineering activities with the engineering community
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It Provides Strongly apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering

		problems.
	PO2 (High)	It involved **strongly** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It gives **Strongly** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety
	PO5 (High)	It provides **Strongly** apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
	PO9 (High)	It gives **Strongly f**unction effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **Strongly c**ommunicate effectively on complex engineering activities with the engineering community
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C308 & PROFESSIONAL COMMUNICATION

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C308.1	-	-	-	-	-	-	-	2	3	3	-	3	-	-
C308.2	-	-	-	-	-	-	-	2	3	3	-	3	-	-
C308.3	-	-	-	-	-	-	-	2	3	3	-	3	-	-
C308.4	-	-	-	-	-	-	-	2	3	3	-	3	-	-
C308.5	-	-	-	-	-	-	-	2	3	3	-	3	-	-
C308	-	-	-	-	-	-	-	2.00	3.00	3.00	-	3.00	-	-

Course Outcome Number	Mapped with POs	Justification
CO1	PO8 (Medium)	It describes **fair** apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **Strongly f**unction effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **Strongly c**ommunicate effectively on complex engineering activities with the engineering community
	PO12 (High)	It provides **Strongly** ability to engage in independent and life-long learning in the broadest context of technological change.
CO2	PO8 (Medium)	It describes **fair** apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **Strongly f**unction effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **Strongly c**ommunicate effectively on complex engineering activities with the engineering community
	PO12 (High)	It provides **Strongly** ability to engage in independent and life-long learning in the broadest context of technological change.

CO3	PO8 (Medium)	It describes **fair** apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **Strongly f**unction effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **Strongly c**ommunicate effectively on complex engineering activities with the engineering community
	PO12 (High)	It provides **Strongly** ability to engage in independent and life-long learning in the broadest context of technological change.
CO4	PO8 (Medium)	It describes **fair** apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **Strongly f**unction effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **Strongly c**ommunicate effectively on complex engineering activities with the engineering community
	PO12 (High)	It provides **Strongly** ability to engage in independent and life-long learning in the broadest context of technological change.
CO5	PO8 (Medium)	It describes **fair** apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **Strongly f**unction effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **Strongly c**ommunicate effectively on complex engineering activities with the engineering community
	PO12 (High)	It provides **Strongly** ability to engage in independent and life-long learning in the broadest context of technological change.

COURSE CODE & NAME : C309 & OBJECT ORIENTED PROGRAMMING LABORATORY													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C309.1	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**1**	**-**	**2**	**2**	**2**
C309.2	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**1**	**-**	**2**	**2**	**2**
C309.3	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**1**	**-**	**2**	**2**	**2**
C309.4	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**1**	**-**	**2**	**2**	**2**
C309.5	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**1**	**-**	**2**	**2**	**2**
C309	**3.00**	**3.00**	**3.00**	**-**	**-**	**-**	**-**	**-**	**2.00**	**1.00**	**-**	**2.00**	**2.00**	**2.00**

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It provides **strongly** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **Strongly** formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions
	PO3 (High)	It describes **Strongly** solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration
	PO9 (Medium)	It gives **fair** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
	PO10 (Low)	It provides **poor** effectively on complex engineering activities with the engineering community and with society at large
	PO12 (Medium)	It describes **fair** and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

CO2	PO1 (High)	It provides **strongly** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **Strongly** formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions
	PO3 (High)	It describes **Strongly** solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration
	PO9 (Medium)	It gives **fair** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
	PO10 (Low)	It provides **poor** effectively on complex engineering activities with the engineering community and with society at large
	PO12 (Medium)	It describes **fair** and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It provides **strongly** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **Strongly** formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions
	PO3 (High)	It describes **Strongly** solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration
	PO9 (Medium)	It gives **fair** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
	PO10 (Low)	It provides **poor** effectively on complex engineering activities with the engineering community and with society at large
	PO12 (Medium)	It describes **fair** and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.

	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It provides **strongly** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **Strongly** formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions
	PO3 (High)	It describes **Strongly** solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration
	PO9 (Medium)	It gives **fair** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
	PO10 (Low)	It provides **poor** effectively on complex engineering activities with the engineering community and with society at large
	PO12 (Medium)	It describes **fair** and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It provides **strongly** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **Strongly** formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions
	PO3 (High)	It describes **Strongly** solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration
	PO9 (Medium)	It gives **fair** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
	PO10 (Low)	It provides **poor** effectively on complex engineering activities with the engineering community and with society at large
	PO12 (Medium)	It describes **fair** and ability to engage in independent and life-long learning in the broadest context of technological change.

	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C310 & SOLID STATE DRIVES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C310.1	3	2	2	-	2	-	-	-	-	-	-	2	-	2
C310.2	3	3	3	3	-	-	-	-	-	-	-	2	2	2
C310.3	3	3	3	-	2	-	-	-	-	-	-	2	-	2
C310.4	3	2	2	-	-	-	-	-	-	-	-	2	-	2
C310.5	3	2	2	2	2	-	-	-	-	-	-	2	2	2
C310	3.00	2.40	2.40	2.50	2.00	-	-	-	-	-	-	2.00	2.00	2.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It Provides **Strongly** apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It gives **fair** formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions
	PO3 (Medium)	It gives **fair** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety.
	PO5 (Medium)	It provides **fair** apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

	PO12(Medium)	It has **fair** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It Provides **Strongly** apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **strong** formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions
	PO3 (High)	It gives **strong** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety.
	PO4 (High)	It describes **Strongly** knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
	PO12(Medium)	It has **fair** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It Provides **Strongly** apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **Strongly** formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions
	PO3 (High)	It gives **Strongly** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety.
	PO5 (Medium)	It provides **fair** apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an

		understanding of the limitations.
	PO12(Medium)	It has **fair** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It Provides **Strongly** apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It gives **fair** formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions
	PO3 (Medium)	It gives **fair** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety.
	PO12(Medium)	It has **fair** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It Provides **Strongly** apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It gives **fair** formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions
	PO3 (Medium)	It gives **fair** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety.
	PO4 (Medium)	It describes **fair** knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
	PO5 (Medium)	It provides **fair** apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an

		understanding of the limitations.
	PO12(Medium)	It has **fair** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C311 & PROTECTION AND SWITCHGEAR

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C311.1	2	2	-	-	-	-	-	-	-	-	-	-	-	2
C311.2	3	3	3	2	-	-	-	-	-	-	-	-	-	2
C311.3	3	3	3	2	2	-	-	-	-	-	-	-	2	2
C311.4	3	3	3	-	2	-	-	-	-	-	-	-	-	2
C311.5	3	3	2	-	-	-	-	-	-	-	-	-	-	2
C311	2.80	2.80	2.75	2.00	2.00	-	-	-	-	-	-	-	2.00	2.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (Medium)	It involves **fair** engineering fundamentals and specification of faults to design protective schemes.
	PO2 (Medium)	It involves **fair** Identifies and formulation for estimating faults to fix protective schemes.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It involves **strong** knowledge of mathematics and engineering fundamentals for planning protection schemes for various apparatus.

	PO2 (High)	It has a **strong** identification of type of fault and substantiated conclusion to design various protection schemes for motors, generators and various other power system components.
	PO3 (High)	It involves **strong** design solutions , public, and environmental consideration while placing various types of relay for power system apparatus
	PO4 (Medium)	It involves **fair** research based knowledge in protection scheme for various faults in motor, generator ,transformer and transmission line.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It involves **strong** knowledge of mathematics and engineering fundamentals for planning protection schemes for various apparatus.
	PO2 (High)	It has a **strong** identification of type of fault and substantiated conclusion to design various protection schemes for motors, generators and various other power system components.
	PO3 (High)	It involves **strong** design solutions , public, and environmental consideration while placing various types of relay for power system apparatus
	PO4 (Medium)	It involves **fair** research based knowledge in protection scheme for various faults in motor , generator ,transformer and transmission line.
	PO5(Medium)	It involves **fair** usage of modern tools to design and analyze protection scheme for power system apparatus.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It involves **strong** knowledge of mathematics and engineering to apply various
	PO2 (High)	It has a **strong** identification and formulation required for estimating various types fault to design static and numerical relays.
	PO3 (High)	It involves **strong** design solution, public, and environmental consideration while placing various static and numerical relay in a power system.

	PO5 (Medium)	It has a **fair** usage of modern tools to evaluate fault current for setting various static and numerical relay.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It has a **strong** engineering fundamentals, specification and solutions to analyze the concepts and principles of various circuit breakers.
	PO2 (High)	It involves **strong** formulation and literature review for concepts and principle of various circuit breakers.
	PO3 (Medium)	It has **fair** design solution ,public and environment consideration while placing various circuit breakers in a power system.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C312 & EMBEDDED SYSTEMS

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C312.1	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
C312.2	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
C312.3	**3**	**3**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**
C312.4	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**
C312.5	**3**	**3**	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**2**
C312	**3.00**	**2.60**	**2.40**	**3.00**	**2.50**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.33**	**2.00**

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	**Strongly** mapped as students acquire fundamental understanding of embedded systems and microprocessors. Understand embedded system design process through real world examples.

	PO2 (Medium)	**Fairly** mapped as students acquire ability to use hardware, software tools in embedded systems to Identify, formulate, review research literature, and analyze complex engineering problems
	PO3 (Medium)	**Fairly** mapped as students acquire basic idea in finding solution to complex problems related to designing with computing platforms.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	**Strongly** mapped as students learn different types of communication protocols related to Processors and peripherals.
	PO2 (High)	**Strongly** mapped as students learn principles in Embedded networking to Identify and analyze complex engineering problems
	PO3 (High)	**Strongly** mapped as students learn to solve complex problems related to Embedded device drivers and communication protocols.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	**Strongly** mapped as students gain knowledge in fundamentals related to development strategies for developing embedded firmware environment
	PO2 (High)	**Strongly** mapped as students acquire ability to Identify, formulate and analyze complex engineering problems related to embedded firmware development
	PO3 (Medium)	**Fairly** mapped as students learn to specific skill set for providing solution to complex problems in embedded firmware development
	PO5 (Medium)	**Fairly** mapped as students understand tools in embedded firmware development
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	**Strongly** mapped as students acquire the knowledge of threads and IPC.

	PO2 (Medium)	**Fairly** mapped as students acquire ability to identify, formulate and analyze complex engineering problems related to real time applications.
	PO3 (Medium)	**Fairly** mapped as it involves providing idea in finding solution to complex problems related to task assignment and scheduling.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	**Strongly** mapped as students acquire knowledge in developing software and hardware modules for embedded application real time case studies
	PO2 (High)	**Strongly** mapped as students learn principles in Embedded development to identify and analyze complex engineering problems for real time case studies.
	PO3 (High)	**Strongly** mapped as it involves providing idea in finding solution to complex problems related to real time case studies.
	PO4 (High)	**Strongly** mapped as students gain knowledge to provide valid conclusions for investigating real time systems.
	PO5 (High)	**Strongly** mapped as students understand tools in embedded firmware development
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C313 & MODERN POWER CONVERTERS

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C313.1	3	2	-	-	-	-	-	-	-	-	-	-	-	2
C313.2	3	3	3	2	-	-	-	-	-	-	-	-	2	2
C313.3	3	3	3	2	-	-	-	-	-	-	-	-	-	2
C313.4	3	3	3	2	2	-	-	-	-	-	-	-	2	2
C313.5	3	3	-	2	2	-	-	-	-	-	-	-	2	2
C313	3.00	2.80	3.00	2.00	2.00	-	-	-	-	-	-	-	2.00	2.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It involves **strong** theory in science and mathematics related to concepts of switched mode power supplies
	PO2 (Medium)	It provides **fair** idea in first principles of mathematics, science, and engineering sciences related to fundamentals of switched mode power supplies
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It involves **strong** theory in science and mathematics related to operation of phase Controlled Rectifiers
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to apply the inverters and essentiality of harmonic control in power electronic circuits.
	PO3 (High)	It involves providing **strong** idea in finding design and development solution of three phase controlled rectifier
	PO4 (Medium)	It involves **fair** theory in science,design and analysis and mathematics related to Inverter performances and analysis
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.

	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It involves **strong** theory in science and mathematics related to operation of phase Controlled Rectifiers
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to apply the inverters and essentiality of harmonic control in power electronic circuits.
	PO3 (Medium)	It involves providing **strong** idea in finding design and development solution of three phase controlled rectifier
	PO4 (Medium)	It involves **fair** theory in science, design and analysis and mathematics related to Inverter performances and analysis.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It involves **strong** theory in science and mathematics related to Apply the AC-AC converters
	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to fundamentals of performances characteristics of concepts of ZVS, ZCS, and converter.
	PO3 (High)	It involves providing **strong** idea in finding design and development solution of concepts of Quasi resonant converters
	PO4 (Medium)	It involves **fair** theory in science and mathematics analysis related to harmonic control concepts of ZVS, ZCS, Quasi resonant converters
	PO5 (Medium)	It describes **fair** apply appropriate techniques, resources, and modern engineering and IT tools including prediction.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It involves **strong** theory in science and mathematics related to Apply the converters for AC-DC conversion and SMPS

	PO2 (High)	It provides **strong** idea in first principles of mathematics, science, and engineering sciences related to fundamentals of performance characteristics of converters for AC-DC conversion and SMPS .
	PO4 (Medium)	It involves only **fair** knowledge to provide valid conclusions for investigating complex problems in equivalent circuit of Apply the converters for AC-DC conversion and SMPS using research-based knowledge and research methods
	PO5 (Medium)	This course outcome provides **fair** knowledge to modeling of Apply the converters for AC-DC conversion and SMPS
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C314 & SPECIAL ELECTRICAL MACHINES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C314.1	3	2	2	-	-	-	-	-	-	-	-	-	-	2
C314.2	3	3	2	-	-	-	-	-	-	-	-	-	-	2
C314.3	3	3	2	-	-	-	-	-	-	-	-	-	2	2
C314.4	3	3	2	2	2	-	-	-	-	-	-	-	2	2
C314.5	3	3	2	-	2	-	-	-	-	-	-	-	-	2
C314	3.00	2.80	2.00	2.00	2.00	-	-	-	-	-	-	-	2.00	2.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It Provides **Strongly** apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It gives **fair** formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions
	PO3 (Medium)	It gives **fair** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It Provides **Strongly** apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **Strongly** formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions
	PO3 (Medium)	It gives **fair** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety.

	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It Provides **Strongly** apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **Strongly** formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions
	PO3 (Medium)	It gives **fair** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It Provides **Strongly** apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **Strongly** formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions
	PO3 (Medium)	It gives **fair** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety.
	PO4 (Medium)	It describes **fair** appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
	PO5 (Medium)	It gives **fair** informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable

		energy industries with ethical standards.
CO5	PO1 (High)	It Provides **Strongly** apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **Strongly** formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions
	PO3 (Medium)	It gives **fair** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety.
	PO5 (Medium)	It gives **fair** informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C315 & POWER ELECTRONICS AND DRIVES LABORATORY

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C315.1	3	3	3	3	-	-	-	-	3	3	-	3	3	3
C315.2	3	3	3	3	-	-	-	-	3	3	-	3	3	3
C315.3	3	3	3	3	-	-	-	-	3	3	-	3	3	3
C315.4	3	3	3	3	-	-	-	-	3	3	-	3	3	3
C315.5	3	3	3	3	3	-	-	-	3	3	-	3	3	3
C315	3.00	3.00	3.00	3.00	3.00	-	-	-	3.00	3.00	-	3.00	3.00	3.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It describes the **Strong** mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **Strongly** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It explains **Strong** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety
	PO4 (High)	It gives **strong** research-based knowledge and research methods including design of experiments, analysis and interpretation of data
	PO9 (High)	It provide **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **strong** effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend
	PO12 (High)	It deals **Strongly** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strongly** modern tools and provides solutions for the real time problems related to energy conservation.

	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It describes the **Strong** mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **Strongly** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It explains **Strong** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety
	PO4 (High)	It gives **strong** research-based knowledge and research methods including design of experiments, analysis and interpretation of data
	PO9 (High)	It provide **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **strong** effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend
	PO12 (High)	It deals **Strongly** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strongly** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It describes the **Strong** mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **Strongly** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It explains **Strong** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety
	PO4 (High)	It gives **strong** research-based knowledge and research methods including design of experiments, analysis and interpretation of data

	PO9 (High)	It provide **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **strong** effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend
	PO12 (High)	It deals **Strongly** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strongly** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It describes the **Strong** mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **Strongly** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It explains **Strong** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety
	PO4 (High)	It gives **strong** research-based knowledge and research methods including design of experiments, analysis and interpretation of data
	PO9 (High)	It provide **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **strong** effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend
	PO12 (High)	It deals **Strongly** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strongly** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

CO5	PO1 (High)	It describes the **Strong** mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **Strongly** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It explains **Strong** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety
	PO4 (High)	It gives **strong** research-based knowledge and research methods including design of experiments, analysis and interpretation of data
	PO5 (High)	It gives **strong** appropriate techniques, resources, and modern engineering and IT tools including prediction
	PO9 (High)	It provide **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **strong** effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend
	PO12 (High)	It deals **Strongly** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strongly** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C316 & MICROPROCESSORS AND MICROCONTROLLERS LABORATORY														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C316.1	**3**	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**3**	**3**	**-**	**3**	**2**	**3**
C316.2	**3**	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**3**	**3**	**-**	**3**	**2**	**3**
C316.3	**3**	**3**	**3**	**3**	**3**	**-**	**-**	**-**	**3**	**3**	**-**	**3**	**2**	**3**
C316.4	**3**	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**3**	**3**	**-**	**3**	**2**	**3**
C316.5	**3**	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**3**	**3**	**-**	**3**	**2**	**3**
C316	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**-**	**-**	**-**	**3.00**	**3.00**	**-**	**3.00**	**2.00**	**3.00**

Course Outcome Number	**Mapped with POs**	**Justification**
CO1	PO1 (High)	It involves **strong** theoretical knowledge with 8085, 8051 Microprocessors and controllers Addressing modes.
	PO2 (High)	It provides **strong** idea in microprocessors and controllers to solve the solution which occurs in processors.
	PO3 (High)	It involves providing **strong** idea in finding solution to program level issues in the 8085 and 8051.
	PO4 (High)	It **strongly** involved with research-based knowledge and research methods including design of experiments, analysis and interpretation of data
	PO9 (High)	It provide **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **strong** effectively on complex engineering activities with the engineering community
	PO11 (High)	It deals **strong** eco system of the field study in the practices of engineering technology.
	PSO1(Medium)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.

	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It involves **strong** theoretical knowledge with 8085, 8051 Microprocessors and controllers Addressing modes.
	PO2 (High)	It provides **strong** idea in microprocessors and controllers to solve the solution which occurs in processors.
	PO3 (High)	It involves providing **strong** idea in finding solution to program level issues in the 8085 and 8051.
	PO4 (High)	It **strongly** involved with research-based knowledge and research methods including design of experiments, analysis and interpretation of data
	PO9 (High)	It provide **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **strong** effectively on complex engineering activities with the engineering community
	PO11 (High)	It deals **strong** eco system of the field study in the practices of engineering technology.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It involves **strong** theoretical knowledge with 8085, 8051 Microprocessors and controllers Addressing modes.
	PO2 (High)	It provides **strong** idea in microprocessors and controllers to solve the solution which occurs in processors.
	PO3 (High)	It involves providing **strong** idea in finding solution to program level issues in the 8085 and 8051.
	PO4 (High)	It **strongly** involved with research-based knowledge and research methods including design of experiments, analysis and interpretation of data
	PO5 (High)	It **strongly** involved with by the use of modern usage of tool processors and controllers are modeling to solve complex engineering activities.

	PO9 (High)	It provide **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **strong** effectively on complex engineering activities with the engineering community
	PO11 (High)	It deals **fair** eco system of the field study in the practices of engineering technology.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It involves **strong** theoretical knowledge with 8085, 8051 Microprocessors and controllers Addressing modes.
	PO2 (High)	It provides **strong** idea in microprocessors and controllers to solve the solution which occurs in processors.
	PO3 (High)	It involves providing **strong** idea in finding solution to program level issues in the 8085 and 8051.
	PO5 (High)	It **strongly** involved with by the use of modern usage of tool processors and controllers are modeling to solve complex engineering activities.
	PO9 (High)	It provide **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **strong** effectively on complex engineering activities with the engineering community
	PO11 (High)	It deals **strong** eco system of the field study in the practices of engineering technology.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It involves **strong** theoretical knowledge with 8085, 8051 Microprocessors and controllers Addressing modes.

	PO2 (High)	It provides **strong** idea in microprocessors and controllers to solve the solution which occurs in processors.
	PO3 (High)	It involves providing **strong** idea in finding solution to program level issues in the 8085 and 8051.
	PO4 (High)	It **strongly** involved with research-based knowledge and research methods including design of experiments, analysis and interpretation of data
	PO9 (High)	It provide **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It gives **strong** effectively on complex engineering activities with the engineering community
	PO11 (High)	It deals **strong** eco system of the field study in the practices of engineering technology.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C317 & MINI PROJECT													
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C317.1	**3**	**3**	**3**	**3**	**-**	**-**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
C317.2	**3**	**3**	**3**	**3**	**-**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
C317.3	**3**	**3**	**3**	**3**	**-**	**-**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
C317.4	**3**	**3**	**3**	**3**	**-**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
C317.5	**3**	**3**	**3**	**3**	**-**	**-**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
C317	**3.00**	**3.00**	**3.00**	**3.00**	**-**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It describes the **Strong basic** knowledge in mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** valuable analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It gives **Storage** solutions for complex engineering problems and design system components
	PO4 (High)	It provide **storage** research-based knowledge and research methods including design of experiments
	PO7 (High)	It gives **Storage** the impact of the professional engineering solutions in societal and environmental contexts
	PO8 (High)	It provides **storage** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **Storage** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

	PO10 (High)	It provide **storage** effectively on complex engineering activities with the engineering community
	PO11 (High)	It involve **storage** knowledge and understanding of the engineering and management principles
	PO12 (High)	It gives **Storage** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It describes the **Strong basic** knowledge in mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** valuable analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It gives **Storage** solutions for complex engineering problems and design system components
	PO4 (High)	It provide **storage** research-based knowledge and research methods including design of experiments
	PO6(Medium)	It has **fair** 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.
	PO7 (High)	It gives **Storage** the impact of the professional engineering solutions in societal and environmental contexts
	PO8 (High)	It provides **storage** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **Storage** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It provide **storage** effectively on complex engineering activities with the engineering community

	PO11 (High)	It involve **storage** knowledge and understanding of the engineering and management principles
	PO12 (High)	It gives **Storage** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It describes the **Strong basic** knowledge in mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** valuable analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It gives **Storage** solutions for complex engineering problems and design system components
	PO4 (High)	It provide **storage** research-based knowledge and research methods including design of experiments
	PO7 (High)	It gives **Storage** the impact of the professional engineering solutions in societal and environmental contexts
	PO8 (High)	It provides **storage** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **Storage** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It provide **storage** effectively on complex engineering activities with the engineering community
	PO11 (High)	It involve **storage** knowledge and understanding of the engineering and management principles
	PO12 (High)	It gives **Storage** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It describes the **Strong basic** knowledge in mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** valuable analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It gives **Storage** solutions for complex engineering problems and design system components
	PO4 (High)	It provide **storage** research-based knowledge and research methods including design of experiments
	PO6(Medium)	It has **fair** 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.
	PO7 (High)	It gives **Storage** the impact of the professional engineering solutions in societal and environmental contexts
	PO8 (High)	It provides **storage** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **Storage** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It provide **storage** effectively on complex engineering activities with the engineering community
	PO11 (High)	It involve **storage** knowledge and understanding of the engineering and management principles
	PO12 (High)	It gives **Storage** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.

	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It describes the **Strong basic** knowledge in mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** valuable analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It gives **Storage** solutions for complex engineering problems and design system components
	PO4 (High)	It provide **storage** research-based knowledge and research methods including design of experiments
	PO7 (High)	It gives **Storage** the impact of the professional engineering solutions in societal and environmental contexts
	PO8 (High)	It provides **storage** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **Storage** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It provide **storage** effectively on complex engineering activities with the engineering community
	PO11 (High)	It involve **storage** knowledge and understanding of the engineering and management principles
	PO12 (High)	It gives **Storage** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C401 & HIGH VOLTAGE ENGINEERING														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C401.1	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
C401.2	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
C401.3	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**3**	**2**
C401.4	**3**	**2**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**2**
C401.5	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**2**
C401	**3.00**	**2.60**	**2.20**	**2.00**	**2.00**	**-**	**-**	**-**	**-**	**-**	**-**	**2.00**	**3.00**	**2.00**

Course Outcome Number	**Mapped with POs**	**Justification**
CO1	PO1 (High)	It describes the **Strong basic** knowledge in environment, eco system and biodiversity problems in everyday life.
	PO2 (Medium)	It provides **fair** valuable idea to the societal, health and safety measures of bio diversity.
	PO3 (Medium)	It gives **fair** solutions for complex engineering problems and design system components
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It describes the **Strong basic** knowledge in environment, eco system and biodiversity problems in everyday life.
	PO2 (High)	It provides **strong** valuable idea to the societal, health and safety measures of bio diversity.
	PO3 (Medium)	It gives **fair** solutions for complex engineering problems and design system components
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

CO3	PO1 (High)	It describes the **Strong basic** knowledge in environment, eco system and biodiversity problems in everyday life.
	PO2 (High)	It provides **strong** valuable idea to the societal, health and safety measures of bio diversity.
	PO3 (High)	It gives **Storage** solutions for complex engineering problems and design system components
	PO4 (Medium)	It provide **fair** research-based knowledge and research methods including design of experiments
	PO12(Medium)	It has **fair** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It describes the **Strong basic** knowledge in environment, eco system and biodiversity problems in everyday life.
	PO2 (Medium)	It provides **fair** valuable idea to the societal, health and safety measures of bio diversity.
	PO3 (Medium)	It gives **fair** solutions for complex engineering problems and design system components
	PO5 (Medium)	It **fair** involved with by the use of modern usage of tool processors and controllers are modeling to solve complex engineering activities.
	PO12(Medium)	It has **fair** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It describes the **Strong basic** knowledge in environment, eco system and biodiversity problems in everyday life.
	PO2 (High)	It provides **strong** valuable idea to the societal, health and safety measures of bio diversity.

	PO3 (Medium)	It gives **fair** solutions for complex engineering problems and design system components
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C402 & POWER SYSTEM OPERATION AND CONTROL

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C402.1	3	3	2	-	-	-	1	-	-	-	-	3	3	3
C402.2	3	3	2	2	-	-	1	-	-	-	-	-	3	3
C402.3	3	3	3	2	2	3	-	-	-	-	-	-	2	3
C402.4	3	3	3	3	2	3	2	-	-	-	-	3	3	3
C402.5	3	3	3	-	-	-	-	-	-	-	-	-	2	3
C402	3.00	3.00	2.60	2.33	2.00	3.00	1.33	-	-	-	-	3.00	2.60	3.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It involves **strong knowledge of mathematics and** engineering fundamentals for the structure and operation of power system
	PO2 (High)	It involves **strongly** Identifies and formulates with substantiated conclusion for the fundamental structure and operation of power system.
	PO3(Medium)	It involves **fair** design solution and consideration for public and environment for the fundamental operation of a power system
	PO7 (Low)	It involves **basic** contextual knowledge to assess societal , health and safety while applying the fundamental operation of power system.
	PO12(High))	It has a **strong** preparation and ability to engage in independent while applying techniques in power system.

	PSO1(High)	It provides **strong** the modern tools and provide solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It **strongly** uses knowledge of mathematics and engineering to design single and two area systems.
	PO2 (High)	It has a **strong literature** review and substantiate conclusion in fine tuning frequency in both single and two area system.
	PO3(Medium)	It involves **fair design** and development of controllers for controlling power systems.
	PO4 (Medium)	It has **fair** research based knowledge and interpretation of frequency setting for the power system.
	PO7(Low)	It has a **basic** professional engineering solution in societal and environmental contexts while applying frequency controller for single and two area system.
	PSO1(High)	It provides **strong** the modern tools and provide solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It involves **strong** engineering fundamentals to analyze the reactive power control in the power system.
	PO2 (High)	It has a **strong identification** of parameters and substantiated conclusion to design voltage controller.
	PO3 (High)	It involves **strong** design solutions , public, and environmental consideration while maintaining voltage and reactive power control.
	PO4 (Medium)	It involves **fair** research based knowledge to analyze both reactive power and voltage control.
	PO5(Medium)	It involves **fair** usage of modern tools to analyze , control and maintain voltage profile for varying load.
	PO6(High)	It has **strong** 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.

	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It involves **strong** knowledge of mathematics and engineering to analyze and apply unit commitment problems.
	PO2 (High)	It has a **strong** identification and formulation required for economic dispatch problem
	PO3 (High)	It involves **strong** design solution, public, and environmental consideration while applying economic dispatch problem.
	PO4 (High)	It has a **fair usage** of modern tools to analyze and apply both unit commitment and economic dispatch problems.
	PO5 (Medium)	It involves **fair** usage of modern tools to analyze, control and maintain voltage profile for varying load.
	PO6(High)	It has **strong** 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.
	PO7 (Medium)	It has a **fair** professional engineering solution in societal and environmental contexts while applying economic dispatch problem without loss consideration
	PO12 (High)	It has a **strong** preparation and ability to engage in independent while applying techniques to solve unit commitment and economic dispatch problem.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It has **strong** engineering fundamentals, specification and solutions to real time computer control applications.
	PO2 (High)	It has a **strong** identification and formulation required for economic dispatch problem
	PO3 (High)	It has **strong** design solution, public and environment consideration in power system control using computers

	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C403 & RENEWABLE ENERGY SYSTEMS

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C403.1	3	2	-	-	1	-	2	-	-	-	-	-	-	2
C403.2	3	3	2	2	3	-	2	-	-	-	-	1	1	2
C403.3	3	3	3	3	3	3	2	-	-	-	-	1	2	2
C403.4	3	2	-	-	-	-	2	-	-	-	-	1	2	2
C403.5	3	2	-	-	1	-	2	-	-	-	-	-	2	2
C403	3.00	2.40	2.50	2.50	2.00	3.00	2.00	-	-	-	-	1.00	1.75	2.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It describes the **Strong basic** knowledge in mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It provides **fair** valuable idea analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO5 (Low)	It explains **basic** apply apply appropriate techniques, resources, and modern engineering and IT tools including prediction
	PO7 (Medium)	It deals **fair** impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

CO2	PO1 (High)	It describes the **Strong basic** knowledge in mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** valuable idea analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (Medium)	It describes the **fair** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety
	PO4 (Medium)	It describes the **fair** based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
	PO5 (High)	It explains **strong** apply appropriate techniques, resources, and modern engineering.
	PO7 (Medium)	It deals **fair** impact of the professional engineering solutions in societal and environmental contexts
	PO12 (Low)	It explains **basic** ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(Low)	It provides **basic** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It describes the **Strong basic** knowledge in mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **strong** valuable idea analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It describes the **Strong** complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety

	PO4 (High)	It describes the **Strong** based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
	PO5 (Low)	It explains **basic** apply appropriate techniques, resources, and modern engineering.
	PO6(High)	It has **strong** 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.
	PO7 (Medium)	It deals **fair** impact of the professional engineering solutions in societal and environmental contexts
	PO12 (Low)	It explains **basic** ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(Low)	It provides **basic** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It describes the **Strong basic** knowledge in mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It provides **fair** valuable idea analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO7 (Medium)	It deals **fair** impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
	PO12 (Low)	It explains **basic** ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It describes the **Strong basic** knowledge in mathematics, science, engineering fundamentals, and an engineering

		specialization to the solution of complex engineering problems.
	PO2 (Medium)	It provides **fair** valuable idea analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO5 (Low)	It explains **basic** apply apply appropriate techniques, resources, and modern engineering and IT tools including prediction
	PO7 (Medium)	It deals **fair** impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C404 & TESTING OF MATERIALS

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C404.1	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**2**	**-**	**2**
C404.2	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**2**	**-**	**2**
C404.3	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**2**	**2**	**2**
C404.4	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**2**	**-**	**2**
C404.5	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**2**	**-**	**2**
C404	**3.00**	**2.00**	**3.00**	**-**	**-**	**-**	**-**	**-**	**-**	**1.00**	**-**	**2.00**	**2.00**	**2.00**

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It describes the **Strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

	PO2 (Medium)	It provides **fair** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics
	PO3 (High)	It gives **Strongly** solutions for complex engineering problems and design system components or processes
	PO10 (Low)	It provides **poor** Communicate effectively on complex engineering activities with the engineering community
	PO12 (Medium)	It provides **fair** the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It describes the **Strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It provides **fair** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics
	PO3 (High)	It gives **Strongly** solutions for complex engineering problems and design system components or processes
	PO10 (Low)	It provides **basic** Communicate effectively on complex engineering activities with the engineering community
	PO12 (Medium)	It provides **fair** the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It describes the **Strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It provides **fair** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics
	PO3 (High)	It gives **Strongly** solutions for complex engineering problems and design system components or processes
	PO10 (Low)	It provides **basic** Communicate effectively on complex engineering activities with the engineering community

	PO12 (Medium)	It provides **fair** the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It describes the **Strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It provides **fair** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics
	PO3 (High)	It gives **Strongly** solutions for complex engineering problems and design system components or processes
	PO10 (Low)	It provides **basic** Communicate effectively on complex engineering activities with the engineering community
	PO12 (Medium)	It provides **fair** the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It describes the **Strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It provides **fair** analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics
	PO3 (High)	It gives **Strongly** solutions for complex engineering problems and design system components or processes
	PO10 (Low)	It provides **basic** Communicate effectively on complex engineering activities with the engineering community
	PO12 (Medium)	It provides **fair** the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C405 & FIBRE OPTICS AND LASER INSTRUMENTATION

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C405.1	3	2	-	-	1	-	-	-	-	-	-	3	-	2
C405.2	3	3	-	-	1	-	-	-	-	-	-	3	-	2
C405.3	3	3	3	-	1	-	-	-	-	-	-	3	-	2
C405.4	3	3	3	-	1	-	-	-	-	-	-	3	3	2
C405.5	3	2	-	-	1	-	-	-	-	-	-	3	-	2
C405	3.00	2.60	3.00	-	1.00	-	-	-	-	-	-	3.00	3.00	2.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It provide **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It gives **fair** review research literature, and analyze complex engineering problems reaching substantiated
	PO5 (Low)	It involve **poor** apply appropriate techniques, resources, and modern engineering
	PO12 (High)	It gives **strong** need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It provide **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **strong** review research literature, and analyze complex engineering problems reaching substantiated
	PO5 (Low)	It involve **poor** apply appropriate techniques, resources, and modern engineering

	PO12 (High)	It gives **strong** need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It provide **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **strong** review research literature, and analyze complex engineering problems reaching substantiated
	PO3 (High)	It gives **Strongly** solutions for complex engineering problems and design system components or processes
	PO5 (Low)	It involve **poor** apply appropriate techniques, resources, and modern engineering
	PO12 (High)	It gives **strong** need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It provide **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It gives **fair** review research literature, and analyze complex engineering problems reaching substantiated
	PO3 (High)	It gives **Strongly** solutions for complex engineering problems and design system components or processes
	PO5 (Low)	It involve **poor** apply appropriate techniques, resources, and modern engineering
	PO12 (High)	It gives **strong** need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

CO5	PO1 (High)	It provide **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It gives **fair** review research literature, and analyze complex engineering problems reaching substantiated
	PO5 (Low)	It involve **poor** apply appropriate techniques, resources, and modern engineering
	PO12 (High)	It gives **strong** need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C406 & POWER SYSTEMS TRANSIENTS														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C406.1	**2**	**2**	**-**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
C406.2	**2**	**2**	**-**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
C406.3	**2**	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**2**
C406.4	**2**	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**2**
C406.5	**2**	**2**	**-**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
C406	**2.00**	**2.40**	**2.00**	**2.00**	**1.40**	**-**	**-**	**-**	**-**	**-**	**-**	**2.00**	**3.00**	**2.00**

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (Medium)	It provide **fair** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It gives **fair** review research literature, and analyze complex engineering problems reaching substantiated
	PO4 (Low)	It involves **poor** research based knowledge to analyze both reactive power and voltage control.
	PO5 (low)	It involves **poor** usage of modern tools to analyze , control and maintain voltage profile for varying load.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (Medium)	It provide **fair** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

	PO2 (Medium)	It gives **fair** review research literature, and analyze complex engineering problems reaching substantiated
	PO4 (Medium)	It involves **fair** research based knowledge to analyze both reactive power and voltage control.
	PO5 (Low)	It involves **poor** usage of modern tools to analyze , control and maintain voltage profile for varying load.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (Medium)	It provide **fair** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **Strongly** review research literature, and analyze complex engineering problems reaching substantiated
	PO3 (Medium)	It involves **fair** design solutions , public, and environmental consideration while maintaining voltage and reactive power control.
	PO4 (Medium)	It involves **fair** research based knowledge to analyze both reactive power and voltage control.
	PO5 (Medium)	It involves **fair** usage of modern tools to analyze , control and maintain voltage profile for varying load.
	PO12 (Medium)	It gives **fair** need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (Medium)	It provide **fair** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **Strongly** review research literature, and analyze complex engineering problems reaching substantiated
	PO3 (Medium)	It involves **fair** design solutions , public, and environmental consideration while maintaining voltage and reactive power control.

	PO4 (Medium)	It involves **fair** research based knowledge to analyze both reactive power and voltage control.
	PO5 (Medium)	It involves **fair** usage of modern tools to analyze , control and maintain voltage profile for varying load.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (Medium)	It provide **fair** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It gives **fair** review research literature, and analyze complex engineering problems reaching substantiated
	PO4 (High)	It involves **poor** research based knowledge to analyze both reactive power and voltage control.
	PO5 (Low)	It involves **poor** usage of modern tools to analyze , control and maintain voltage profile for varying load.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

OURSE CODE & NAME : C407 & POWER SYSTEM SIMULATION LABORATORY														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C407.1	**3**	**3**	**3**	**3**	**-**	**-**	**-**	**3**	**3**	**3**	**-**	**3**	**3**	**3**
C407.2	**3**	**3**	**3**	**3**	**-**	**-**	**-**	**3**	**3**	**3**	**-**	**3**	**3**	**3**
C407.3	**3**	**3**	**3**	**3**	**-**	**-**	**-**	**3**	**3**	**3**	**-**	**3**	**3**	**3**
C407.4	**3**	**3**	**3**	**3**	**-**	**-**	**-**	**3**	**3**	**3**	**-**	**3**	**3**	**3**
C407.5	**3**	**3**	**3**	**3**	**-**	**-**	**-**	**3**	**3**	**3**	**-**	**3**	**3**	**3**
C407	**3.00**	**3.00**	**3.00**	**3.00**	**-**	**-**	**-**	**3.00**	**3.00**	**3.00**	**-**	**3.00**	**3.00**	**3.00**

Course Outcome Number	**Mapped with POs**	**Justification**
CO1	PO1 (High)	It provides **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **strong** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It applying **strong** solutions for complex engineering problems and design system components
	PO4 (High)	It involves **strong** research-based knowledge and research methods including design of experiments
	PO8 (High)	It provides **strong** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It applying **strong** effectively on complex engineering activities with the engineering community

	PO12 (High)	It involves **strong** ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It provides **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **strong** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It applying **strong** solutions for complex engineering problems and design system components
	PO4 (High)	It involves **strong** research-based knowledge and research methods including design of experiments
	PO8 (High)	It provides **strong** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It applying **strong** effectively on complex engineering activities with the engineering community
	PO12 (High)	It involves **strong** ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It provides **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **strong** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural

		sciences, and engineering sciences.
	PO3 (High)	It applying **strong** solutions for complex engineering problems and design system components
	PO4 (High)	It involves **strong** research-based knowledge and research methods including design of experiments
	PO8 (High)	It provides **strong** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It applying **strong** effectively on complex engineering activities with the engineering community
	PO12 (High)	It involves **strong** ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It provides **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **strong** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It applying **strong** solutions for complex engineering problems and design system components
	PO4 (High)	It involves **strong** research-based knowledge and research methods including design of experiments
	PO8 (High)	It provides **strong** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

	PO10 (High)	It applying **strong** effectively on complex engineering activities with the engineering community
	PO12 (High)	It involves **strong** ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It provides **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **strong** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It applying **strong** solutions for complex engineering problems and design system components
	PO4 (High)	It involves **strong** research-based knowledge and research methods including design of experiments
	PO8 (High)	It provides **strong** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It applying **strong** effectively on complex engineering activities with the engineering community
	PO12 (High)	It involves **strong** ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C408 & RENEWABLE ENERGY SYSTEMS LABORATORY														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C408.1	**3**	**3**	**3**	**3**	**-**	**-**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
C408.2	**3**	**3**	**3**	**3**	**-**	**-**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
C408.3	**3**	**3**	**3**	**3**	**-**	**-**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
C408.4	**3**	**3**	**3**	**3**	**3**	**-**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
C408.5	**3**	**3**	**3**	**3**	**3**	**-**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
C408	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**-**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**

Course Outcome Number	**Mapped with POs**	**Justification**
CO1	PO1 (High)	It provides **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **strong** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It applying **strong** solutions for complex engineering problems and design system components
	PO4 (High)	It involves **strong** research-based knowledge and research methods including design of experiments
	PO7 (High)	It provides **Strongly** impact of the professional engineering solutions in societal and environmental contexts
	PO8 (High)	It provides **strong** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

	PO10 (High)	It applying **strong** effectively on complex engineering activities with the engineering community
	PO11 (High)	It involves **strong** knowledge and understanding of the engineering and management principles
	PO12 (High)	It Gives **Strongly** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It provides **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **strong** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It applying **strong** solutions for complex engineering problems and design system components
	PO4 (High)	It involves **strong** research-based knowledge and research methods including design of experiments
	PO7 (High)	It provides **Strongly** impact of the professional engineering solutions in societal and environmental contexts
	PO8 (High)	It provides **strong** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It applying **strong** effectively on complex engineering activities with the engineering community
	PO11 (High)	It involves **strong** knowledge and understanding of the engineering and management principles
	PO12 (High)	It Gives **Strongly** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It provides **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **strong** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It applying **strong** solutions for complex engineering problems and design system components
	PO4 (High)	It involves **strong** research-based knowledge and research methods including design of experiments
	PO7 (High)	It provides **Strongly** impact of the professional engineering solutions in societal and environmental contexts
	PO8 (High)	It provides **strong** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It applying **strong** effectively on complex engineering activities with the engineering community
	PO11 (High)	It involves **strong** knowledge and understanding of the engineering and management principles
	PO12 (High)	It Gives **Strongly** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It provides **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

	PO2 (High)	It gives **strong** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It applying **strong** solutions for complex engineering problems and design system components
	PO4 (High)	It involves **strong** research-based knowledge and research methods including design of experiments
	PO5 (High)	It gives **strong** apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities
	PO7 (High)	It provides **Strongly** impact of the professional engineering solutions in societal and environmental contexts
	PO8 (High)	It provides **strong** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It applying **strong** effectively on complex engineering activities with the engineering community
	PO11 (High)	It involves **strong** knowledge and understanding of the engineering and management principles
	PO12 (High)	It Gives **Strongly** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It provides **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **strong** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

	PO3 (High)	It applying **strong** solutions for complex engineering problems and design system components
	PO4 (High)	It involves **strong** research-based knowledge and research methods including design of experiments
	PO5 (High)	It gives **strong** apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities
	PO7 (High)	It provides **Strongly** impact of the professional engineering solutions in societal and environmental contexts
	PO8 (High)	It provides **strong** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It applying **strong** effectively on complex engineering activities with the engineering community
	PO11 (High)	It involves **strong** knowledge and understanding of the engineering and management principles
	PO12 (High)	It Gives **Strongly** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C409 & PRINCIPLES OF MANAGEMENT														
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C409.1	**3**	**2**	**2**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**2**
C409.2	**3**	**3**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**2**	**2**
C409.3	**3**	**3**	**3**	**2**	**1**	**-**	**2**	**-**	**-**	**-**	**-**	**3**	**-**	**2**
C409.4	**3**	**3**	**3**	**2**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**3**	**2**	**2**
C409.5	**3**	**2**	**3**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**2**
C409	**3.00**	**2.60**	**2.60**	**2.00**	**1.60**	**-**	**2.00**	**-**	**-**	**-**	**-**	**3.00**	**2.00**	**2.00**

Course Outcome Number	**Mapped with POs**	**Justification**
CO1	PO1 (High)	It describes the **Strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It provides **fair** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (Medium)	It explains **fair** solutions for complex engineering problems and design system components
	PO5 (Low)	It deals **poor** research-based knowledge and research methods including design of experiments
	PO12(High)	It has **strong** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It describes the **Strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

	PO2 (High)	It **provides strongly** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (Medium)	It explains **fair** solutions for complex engineering problems and design system components
	PO5 (Medium)	It deals **fair** research-based knowledge and research methods including design of experiments
	PO12(High)	It has **strong** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It describes the **Strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **Strongly** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It explains **Strongly** solutions for complex engineering problems and design system components
	PO4 (Medium)	It provides **fair** research-based knowledge and research methods including design of experiments, analysis and interpretation of data
	PO5 (Low)	It deals **poor** research-based knowledge and research methods including design of experiments
	PO7 (Medium)	It provide **fair** impact of the professional engineering solutions in societal and environmental contexts.
	PO12(High)	It has **strong** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

CO4	PO1 (High)	It describes the **Strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It provides **Strongly** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It explains **Strongly** solutions for complex engineering problems and design system components
	PO4 (Medium)	It provides **fair** research-based knowledge and research methods including design of experiments, analysis and interpretation of data
	PO5 (Medium)	It deals **fair** research-based knowledge and research methods including design of experiments
	PO7 (Medium)	It provide **fair** impact of the professional engineering solutions in societal and environmental contexts.
	PO12(High)	It has **strong** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It describes the **Strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (Medium)	It provides **fair** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It explains **Strongly** solutions for complex engineering problems and design system components
	PO5 (Medium)	It deals **fair** research-based knowledge and research methods including design of experiments
	PO12(High)	It has **strong** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C410 & SMART GRID

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C410.1	3	2	2	-	-	-	-	-	-	-	-	2	-	2
C410.2	3	3	-	-	-	-	-	2	1	-	-	2	-	2
C410.3	3	3	3	-	-	-	-	2	2	-	-	2	-	2
C410.4	3	3	-	-	-	-	-	-	-	-	-	2	2	2
C410.5	3	3	3	-	-	-	-	-	2	-	-	2	2	2
C410	3.00	2.80	2.67	-	-	-	-	2.00	1.67	-	-	2.00	2.00	2.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It involves **strong** knowledge in engineering specialization about the basics and need for smart grids
	PO2 (Medium)	It provides **moderate** knowledge in analyzing complex engineering problems through detailed study of smart grid system
	PO3 (Medium)	It provides **reasonable** idea about applying the knowledge of smart grid in both national and international scenario
	PO12(Medium)	It has **fair** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO2	PO1 (High)	It involves **strong** knowledge in engineering through different smart grid technologies
	PO2 (High)	It provides **strong** knowledge in analyzing complex engineering problem by various feeder automation transmission systems.

	PO8 (Medium)	It provides **moderate** knowledge in applying the ethical concept with plugin hybrid electric vehicles
	PO9 (Low)	It provides **less** knowledge in individual work towards outage management scenario.
	PO12(Medium)	It has **fair** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It involves **strong** knowledge in engineering specialization about smart meters infrastructure.
	PO2 (High)	It provides **strong** knowledge in analyzing complex engineering problems through AMI structure and its protocols.
	PO3 (Medium)	It provides **reasonable** idea about applying the knowledge of smart grid in both national and international scenario
	PO8 (Medium)	It provides **moderate** knowledge in applying the ethical concept with intelligent electronic devices
	PO9 (Medium)	It provides **less** knowledge in individual work towards monitoring and protection of infrastructure
	PO12(Medium)	It has **fair** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It involves **strong** knowledge in engineering specialization about growth of power quality management in smart grid.
	PO2 (High)	It provides **strong** knowledge in analyzing complex engineering problems through mathematical analysis of PQ issues in RES.
	PO12(Medium)	It has **fair** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.

	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It involves **strong** knowledge in engineering specialization about LAN, HAN & WAN.
	PO2 (High)	It provides **strong** knowledge in analyzing complex engineering problems through mathematical analysis IP based protocols
	PO3 (High)	It provides **strong** idea about applying the knowledge of mathematics smart grid smart meters
	PO9 (Medium)	It provides **less** knowledge in individual work towards cybersecurity role in smart grid.
	PO12(Medium)	It has **fair** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(Medium)	It provides **fair** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (Medium)	It gives **fair** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

COURSE CODE & NAME : C411 & PROJECT WORK

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C411.1	3	3	3	3	3	-	3	3	3	3	3	3	3	3
C411.2	3	3	3	3	3	-	3	3	3	3	3	3	3	3
C411.3	3	3	3	3	3	-	3	3	3	3	3	3	3	3
C411.4	3	3	3	3	3	-	3	3	3	3	3	3	3	3
C411.5	3	3	3	3	3	-	3	3	3	3	3	3	3	3
C411	3.00	3.00	3.00	3.00	3.00	-	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Course Outcome Number	Mapped with POs	Justification
CO1	PO1 (High)	It provides **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **strong** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It applying **strong** solutions for complex engineering problems and design system components
	PO4 (High)	It involves **strong** research-based knowledge and research methods including design of experiments
	PO5 (High)	It involves **strong** apply appropriate techniques, resources, and modern engineering
	PO7 (High)	It gives **strong** impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
	PO8 (High)	It provides **strong** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It applying **strong** effectively on complex engineering activities with the engineering community
	PO11 (High)	It involves **strong** knowledge and understanding of the engineering and management principles
	PO12 (High)	It provide **strong** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

CO2	PO1 (High)	It provides **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **strong** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It applying **strong** solutions for complex engineering problems and design system components
	PO4 (High)	It involves **strong** research-based knowledge and research methods including design of experiments
	PO5 (High)	It involves **strong** apply appropriate techniques, resources, and modern engineering
	PO7 (High)	It gives **strong** impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
	PO8 (High)	It provides **strong** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It applying **strong** effectively on complex engineering activities with the engineering community
	PO11 (High)	It involves **strong** knowledge and understanding of the engineering and management principles
	PO12 (High)	It provide **strong** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO3	PO1 (High)	It provides **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

	PO2 (High)	It gives **strong** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It applying **strong** solutions for complex engineering problems and design system components
	PO4 (High)	It involves **strong** research-based knowledge and research methods including design of experiments
	PO5 (High)	It involves **strong** apply appropriate techniques, resources, and modern engineering
	PO7 (High)	It gives **strong** impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
	PO8 (High)	It provides **strong** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It applying **strong** effectively on complex engineering activities with the engineering community
	PO11 (High)	It involves **strong** knowledge and understanding of the engineering and management principles
	PO12 (High)	It provide **strong** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO4	PO1 (High)	It provides **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **strong** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

	PO3 (High)	It applying **strong** solutions for complex engineering problems and design system components
	PO4 (High)	It involves **strong** research-based knowledge and research methods including design of experiments
	PO5 (High)	It involves **strong** apply appropriate techniques, resources, and modern engineering
	PO7 (High)	It gives **strong** impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
	PO8 (High)	It provides **strong** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It applying **strong** effectively on complex engineering activities with the engineering community
	PO11 (High)	It involves **strong** knowledge and understanding of the engineering and management principles
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	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.
CO5	PO1 (High)	It provides **strong** knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2 (High)	It gives **strong** review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3 (High)	It applying **strong** solutions for complex engineering problems and design system components

	PO4 (High)	It involves **strong** research-based knowledge and research methods including design of experiments
	PO5 (High)	It involves **strong** apply appropriate techniques, resources, and modern engineering
	PO7 (High)	It gives **strong** impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
	PO8 (High)	It provides **strong** ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9 (High)	It gives **strong** effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10 (High)	It applying **strong** effectively on complex engineering activities with the engineering community
	PO11 (High)	It involves **strong** knowledge and understanding of the engineering and management principles
	PO12 (High)	It provide **strong** preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	PSO1(High)	It provides **strong** modern tools and provides solutions for the real time problems related to energy conservation.
	PSO2 (High)	It gives **strong** develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

CO – POs/PSOs MAPPING AVERAGE FOR ALL COURSES

(REGULATION – 2017)

BATCH: 2019-2023

CO VS PO MAPPING TABLE														
COURSE WISE CO VS POs MAPPING AVERAGE														
COURSE CODE	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C101	-	-	-	-	-	-	-	2.00	2.20	3.00	-	3.00	-	-
C102	3.00	3.00	1.20	-	-	-	-	-	-	-	2.00	2.00	-	-
C103	2.40	1.60	-	-	1.00	-	-	-	-	-	-	1.00	-	-
C104	2.00	1.00	1.67	-	1.40	1.60	1.50	-	-	1.25	-	1.00	-	-
C105	3.00	2.60	2.60	2.00	2.33	-	-	-	-	-	-	2.00	-	-
C106	1.00	1.00	2.00	1.00	-	-	-	-	-	2.00	-	2.00	-	-
C107	3.00	2.40	2.20	2.00	2.00	-	-	-	2.33	2.00	2.00	2.00	-	-
C108	2.60	2.00	-	-	-	-	2.67	-	-	-	-	1.00	-	-
C109	-	-	-	-	-	-	-	1.80	2.60	3.00	-	3.00	-	-
C110	3.00	3.00	1.80	-	1.00	-	-	-	-	-	1.50	2.00	-	-
C111	2.40	1.50	-	-	1.67	-	-	-	-	-	-	1.00	-	-
C112	2.00	1.00	1.00	1.50	1.50	-	3.00	-	3.00	-	-	-	-	-
C113	3.00	2.00	2.00	2.00	-	-	-	-	3.00	-	-	-	1.00	2.00
C114	2.00	-	-	-	-	1.40	3.00	-	2.20	-	-	1.00	-	-
C115	1.00	1.00	2.00	1.00	-	-	-	-	-	2.00	-	2.00	2.00	2.20
C116	3.00	2.00	3.00	-	-	-	-	-	3.00	3.00	-	3.00	3.00	2.00

CO VS PO MAPPING TABLE														
COURSE WISE CO VS POs MAPPING AVERAGE														
COURSE CODE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C201	3.00	2.80	3.00	-	3.00	-	-	-	-	-	2.50	2.00	2.00	2.00
C202	2.80	3.00	3.00	2.60	1.60	-	-	-	-	-	-	-	2.00	3.00
C203	2.80	3.00	2.60	2.60	2.00	-	-	-	-	-	-	-	2.00	3.00
C204	3.00	2.80	2.80	2.60	-	-	-	-	-	-	-	2.00	2.00	3.00
C205	2.40	2.80	2.67	2.00	-	-	-	-	-	-	-	-	1.33	2.00
C206	3.00	2.80	2.60	2.25	2.00	3.00	3.00	3.00	-	-	-	2.60	2.00	2.00
C207	3.00	3.00	3.00	-	2.20	-	-	-	2.00	2.00	-	-	3.00	3.00
C208	3.00	3.00	2.40	2.00	2.00	3.00	-	-	2.00	2.00	-	-	1.00	3.00
C209	3.00	3.00	1.00	-	2.33	2.00	-	-	-	-	-	2.25	2.00	2.00
C210	3.00	3.00	2.80	2.40	-	-	1.00	-	-	-	-	-	2.00	2.00
C211	3.00	3.00	2.80	2.00	2.00	-	-	1.00	1.00	2.00	3.00	-	2.00	2.00
C212	3.00	2.80	2.40	2.33	3.00	2.00	-	-	-	-	-	-	2.00	2.00
C213	3.00	2.60	2.20	2.00	-	-	-	-	-	-	-	-	2.50	2.00
C214	3.00	2.60	2.40	2.00	2.00	-	-	-	-	-	-	-	2.00	2.00
C215	3.00	3.00	3.00	2.00	-	-	-	-	2.00	2.00	-	-	2.00	3.00
C216	3.00	3.00	3.00	2.00	2.00	-	-	-	2.00	2.00	-	-	2.00	3.00
C217	3.00	3.00	-	2.60	2.40	1.60	-	1.60	2.20	2.20	3.00	3.00	3.00	3.00

CO VS PO MAPPING TABLE														
COURSE WISE CO VS POs MAPPING AVERAGE														
COURSE CODE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C301	3.00	3.00	2.60	2.60	2.50	-	-	-	-	-	-	-	2.00	2.00
C302	3.00	3.00	2.40	3.00	2.50	-	-	-	-	-	-	-	3.00	2.00
C303	3.00	2.80	2.60	3.00	2.25	-	-	-	-	-	-	-	2.00	2.00
C304	3.00	2.80	2.40	3.00	2.00	-	-	-	-	-	-	-	2.00	2.00
C305	3.00	1.40	1.80	2.00	-	-	-	-	-	-	-	2.00	1.00	2.00
C306	3.00	2.60	2.20	-	2.00	-	-	-	-	-	-	-	2.00	2.00
C307	3.00	3.00	3.00	-	3.00	-	-	-	2.00	2.00	-	3.00	3.00	3.00
C308	-	-	-	-	-	-	-	2.00	3.00	3.00	-	3.00	-	-
C309	3.00	3.00	3.00	-	-	-	-	-	2.00	1.00	-	2.00	2.00	2.00
C310	3.00	2.40	2.40	2.50	2.00	-	-	-	-	-	-	2.00	2.00	2.00
C311	2.80	2.80	2.75	2.00	2.00	-	-	-	-	-	-	-	2.00	2.00
C312	3.00	2.60	2.40	3.00	2.50	-	-	-	-	-	-	-	2.33	2.00
C313	3.00	2.80	3.00	3.00	3.00	-	-	-	-	-	-	-	2.00	2.00
C314	3.00	2.80	2.00	2.00	2.00	-	-	-	-	-	-	-	2.00	2.00
C315	3.00	3.00	3.00	3.00	3.00	-	-	-	3.00	3.00	-	3.00	3.00	3.00
C316	3.00	3.00	3.00	3.00	3.00	-	-	-	3.00	3.00	-	3.00	2.00	3.00
C317	3.00	3.00	3.00	3.00	-	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

CO VS PO MAPPING TABLE														
COURSE WISE CO VS POs MAPPING AVERAGE														
COURSE CODE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C401	3.00	2.60	2.20	2.00	2.00	-	-	-	-	-	-	2.00	3.00	2.00
C402	3.00	3.00	2.60	2.33	2.00	3.00	1.33	-	-	-	-	3.00	2.60	3.00
C403	3.00	2.40	2.50	2.50	2.00	3.00	2.00	-	-	-	-	3.00	3.00	3.00
C404	3.00	2.00	3.00	-	-	-	-	-	-	1.00	-	2.00	3.00	2.00
C405	3.00	2.60	3.00	-	1.00	-	-	-	-	-	-	3.00	3.00	2.00
C406	3.00	3.00	3.00	3.00	3.00	-	-	-	-	-	-	3.00	3.00	2.00
C407	3.00	3.00	3.00	3.00	-	-	-	3.00	3.00	3.00	-	3.00	3.00	3.00
C408	3.00	3.00	3.00	3.00	3.00	-	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
C409	-	-	-	-	-	-	-	2.00	2.00	2.00	2.00	2.00	-	-
C410	3.00	2.80	2.67	-	-	-	-	2.00	1.67	-	-	2.00	2.00	2.00
C411	3.00	3.00	3.00	3.00	3.00	-	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

5.2. Mapping Table for Co- Curricular Activities

PO MAPPING TABLE									
CO-CURRICULAR VS POs / PSOs MAPPING AVERAGE									
Co- Curricular Activities	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
Guest Lectures / Technical Seminars / Webinar / Workshop / Symposium	**2.00**	**2.00**	**2.00**	**3.00**	**3.00**	**1.00**	**2.00**	**2.00**	**2.00**
Value Added Courses	**2.00**	**2.00**	**2.00**	**3.00**	**3.00**	**1.00**	**2.00**	**3.00**	**3.00**
Internship / In-plant Training/ Industrial Visit	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**2.00**	**2.00**	**2.00**
Programme on Ethics/Entrepreneurship/IPR	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**

ASSESSMENT TOOLS

&

PROCESS FOR CO ATTAINMENT

6.1. ATTAINMENT OF COURSE OUTCOMES

CO Assessment Rubrics

The assessment rubrics are set with consideration of internal assessment tests and university examinations. The internal assessment carries 20% weightage from all the two internal tests and one model examination whereas the university examination carries 80% weightage as per ANNA UNIVERISTY REGULATION 2017 shows in Figure 6.1.

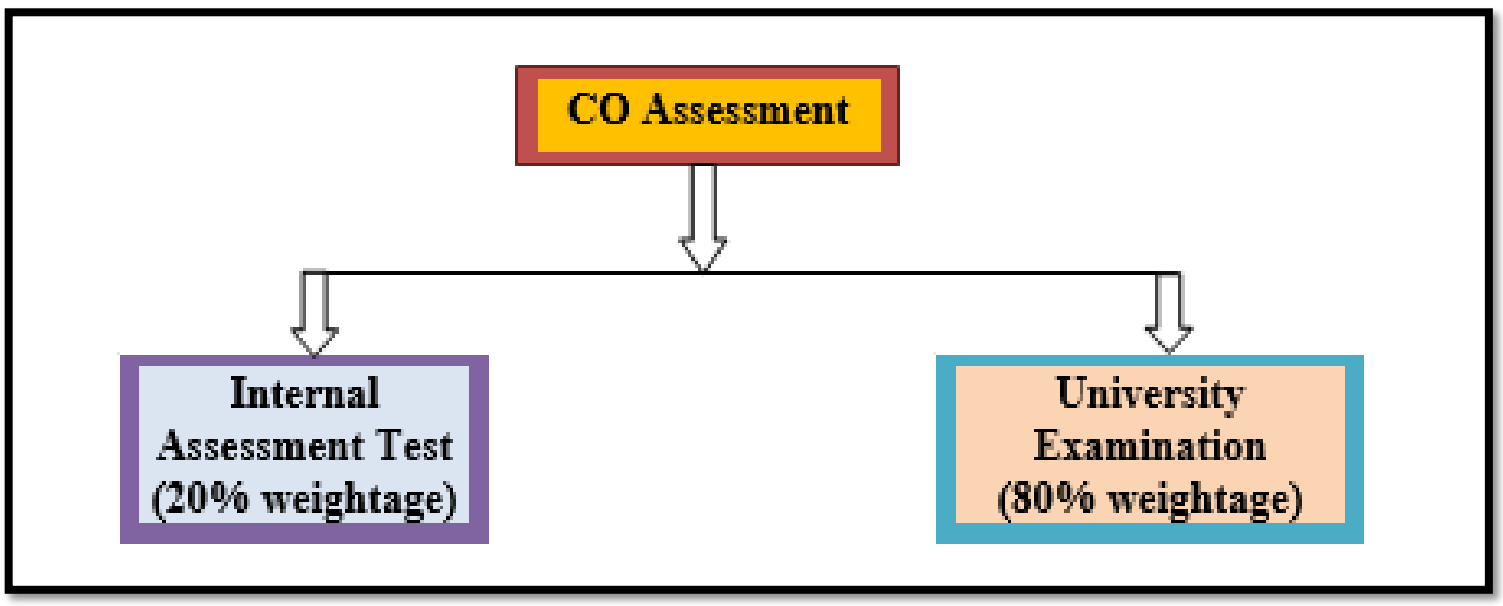


Figure: 6.1. CO Assessment Rubrics

The evaluation of course outcomes is based on the performance of students in both university examination and internal assessment tests. The Table.6.1 shows the assessment methods adopted in university examination as well as internal assessment tests.

Type of Assessment	Course Type	Process of Assessment	Minimum Frequency
Internal	Theory Course	Internal & Model Assessment	3 / Course
	Practical Course	Model Assessment	1 / Course
	Project	Review	4 / Course
University	Theory Course	Examination with question paper set by Anna University	1 / Course
	Practical Course	Examination with question paper set by Anna University	1 / Course
	Project	Viva-Voce	1 / Course

Table 6.1 Assessment processes

i) THEORY COURSE:

Internal Assessment Tests:

After commencement of the course, the department will conduct two internal assessment tests and one model assessment test scheduled as per university academic schedule. Care will be taken such that completion of **2 units & 5 units** before the internal and the model assessment tests respectively. The examinations are conducted under the guidance of department exam cell in-charge.

University Examinations:

The students should be regular to class and each student needs minimum of 75% of attendance in all courses for to be eligible in appearing for the university examination of a respective course. The end-semester examinations are conducted for 100 marks and for a three-hour duration. They are evaluated by external examiners and the marks obtained are converted into grade system as per Anna University Norms.

ii) PRACTICAL COURSE:

Laboratory courses provide students with active experience with ideas and with the opportunity to explore methods used in their discipline. In order to simplify communication among the students and to develop team work, the students are projected to carry out experiments in groups. Performance assessment is based on the ability of the students to actively participate in the successfully conduct the prescribed practical work to attain appropriate conclusions.

Model Practical Examination:

The Model practical examination of 3 hours for the entire syllabus of the course and is conducted in which the student will perform experiments to check their performances. The question set will be provided by an internal expert.

University Examinations:

The End-semester practical examinations are conducted for 3 hours in which entire syllabus of the course are covered. The question set will be framed by both Internal and External examiners.

iii) PROJECT:

Project work is projected to be a challenge to knowledge and innovative capabilities and give students the opportunity to create and apply knowledge and systematic skills learned in the different disciplines. Students are instructed to the detailed analysis and draw the conclusions based on the objectives and work

plan formulated. They are required to submit a report and explain all aspects of the work.

As per the University norms the grade system in the table 6.2

Range of Marks	Grade Point	Letter Grade (R 2017)
91-100	10	O
81-90	9	A+
71-80	8	A
61-70	7	B+
50-60	6	B
<50	0	RA
Shortage of Attendance		SA
Withdrawal		W

Table 6.2 Grade Equivalence as per Anna University Regulation 2017 norms

Measuring Course Outcomes attained:

A. Measuring CO attainment through Internal Assessments:

Table 6.3 Attainment levels of COs through Internal Assessments

Assessment Methods	Attainment Levels	
Internal Assessment	**Level 1**	Up to 59% of students scored marks 70% and above in Internal Assessment Tests
	Level 2	60% - 79 % of students scored marks 70% and above in Internal Assessment Tests
	Level 3	80% and above students scored marks 70% and above in Internal Assessment Tests

Table.6.3. Internal Assessment level

B. Measuring CO attainment through University Examination:

Table 6.4 Attainment levels of COs through University Examination

Assessment Methods	Attainment Levels	
Internal Assessment	**Level 1**	Up to 59% of students scored marks 70% and above in University Examination
	Level 2	60-79% of students scored marks 70% and above in University Examination
	Level 3	80% and above students scored marks 70% and above in University Examination

Table 6.4. University Examination Assessment level

Final Course Outcomes attainment is calculated by allocating 20% weightage to internal assessment tests and 80% weightage to university grade of the student. The sample CO evaluation details and CO attainment calculation procedure are described as follows.

SAMPLE CO ATTAINMENT CALCULATION

7. Sample CO Attainment Calculation

CO attainment calculation for the course is given in the following table 7.1 & 7.2.

Table 7.1. CO evaluation for C203 – EE8391 ELECTROMAGNETIC THEORY

			TEST1		TEST2		TEST3					
Sl	**Reg No**	Name	**CO1**	**CO2**	**CO3**	**CO4**	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**UNIV EXAM(10)**
1	920820105001	BASKAR A	40	26	53	35	24	13	13	13	13	9
2	920820105002	BHARATHIRAJA C	48	32	52	34	25	13	13	13	13	9
3	920820105003	GOVINTHAVASAN A	60	40	58	38	29	15	15	15	15	10
4	920820105004	HARISH G	41	27	53	35	25	13	13	13	13	9
5	920820105005	ISHAS AHAMED A	55	37	59	39	28	15	15	15	15	10
6	920820105007	JEYARAM M	50	34	52	34	24	13	13	13	13	8
7	920820105008	JUSTIN THIRAVIYAM A	46	30	50	34	23	12	12	12	12	8
8	920820105009	KABIL SHARMA M	41	27	55	37	27	14	14	14	14	9
9	920820105010	LOGESH KUMAR M	55	37	56	38	25	13	13	13	13	10
10	920820105011	MAHENDRA S	41	27	55	37	24	13	13	13	13	9
11	920820105012	MOHAMMED ASHIK S	49	33	54	36	24	13	13	13	13	10
12	920820105013	RAMAR V	34	22	55	37	23	12	12	12	12	9
13	920820105014	SARAVANAKUMAR S	53	35	54	36	28	15	15	15	15	10
14	920820105015	SARAVANA MUTHU K	55	37	55	37	29	15	15	15	15	9
15	920820105016	SARWESH R	32	22	54	36	26	14	14	14	14	9
16	920820105017	THARUN N	60	40	60	40	31	17	17	17	17	10
17	920820105018	THAVAMANI A	58	38	60	40	31	16	16	16	16	10
18	920820105019	VENKATESH V	58	38	56	38	30	16	16	16	16	10
19	920820105301	ARUN KUMAR S	41	28	58	38	28	15	15	15	15	10
20	920820105302	BHARATHA RAJA S	43	29	52	34	28	15	15	15	15	8
21	920820105303	BRINTHA R	60	40	59	39	31	17	17	17	17	10
22	920820105304	GANESH S	58	38	60	40	27	14	14	14	14	10
23	920820105305	GEETHANJALI DEVI M	37	25	52	34	27	14	14	14	14	9
24	920820105306	HAREESH KS	40	26	53	35	27	14	14	14	14	7
25	920820105307	KALAISELVI S	52	34	58	38	28	15	15	15	15	9
26	920820105308	KRISHNA PANDIYAN S	60	40	60	40	31	16	16	16	16	9
27	920820105309	LAKSHMANAN T	55	37	56	38	28	15	15	15	15	9
28	920820105310	LOGANATHAN M	47	31	58	38	28	15	15	15	15	10
29	920820105311	MOHAMMED HARISH H	50	34	59	39	29	15	15	15	15	10
30	920820105312	MONIKA K	52	34	58	38	29	16	16	16	16	9
31	920820105313	POOVARASAN R	48	32	59	39	30	16	16	16	16	9
32	920820105314	PRAVEEN KUMAR R	53	35	59	39	31	17	17	17	17	9
33	920820105315	REEGAN S	46	30	52	34	28	15	15	15	15	9
34	920820105316	SANRON MATHI S	47	31	52	34	28	15	15	15	15	8
35	920820105317	SHYLESH KUMAR V	55	37	55	37	29	15	15	15	15	9
36	920821105318	SIVA S	41	27	53	35	29	15	15	15	15	9
		NO OF STUDENTS ATTENDED	**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**
		MAX MARK CO WISE	**60**	**40**	**60**	**40**	**32**	**17**	**17**	**17**	**17**	10
	THRESHOLD	70	**42**	**28**	**42**	**28**	**22.4**	**11.9**	**11.9**	**11.9**	**11.9**	**7**
		CO/ No of students above threshold 60%	**26**	**26**	**36**	**36**	**36**	**36**	**36**	**36**	**36**	36
		LEVEL	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**

Table 7.1.Evaluation of Course Outcome for batch 2020-2024

D. CO Attainment Calculation:

Table 7.2.CO attainment calculation for C203 – EE8391 ELECTROMAGNETIC THEORY

C310	INT. EXAM1	INT. EXAM 2	MODEL EXAM	IAT	UNIV
CO1	3	0	3	3.00	3
CO2	3	0	3	3.00	3
CO3	0	3	3	3.00	3
CO4	0	3	3	3.00	3
CO5	0	0	3	3.00	3
INTERNAL/UNIV ATTAINMENTS				**3.00**	**3.00**
WEIGHTAGE				**20%**	**80%**
CO ATTAINTMENT FOR THE COURSE				**0.60**	**2.40**
FINAL CO ATTAINTMNET FOR THE COURSE				**3.00**	

Table 7.2.COs Attainment for the course for batch 2020-2024

Table 7.2. COs Attainment for the course for Electromagnetic Field Theory for batch 2020-2024. Table 7.2 shows the sample CO attainment of course C203. Internal Assessment Test-1 addresses the COs C203.1 and C203.2 whereas Internal Assessment Test-2 addresses C203.3, C203.4 Model Assessment Test-3 addresses all the COs C203.1, C203.2, C203.3, C203.4, and C203.5 which covers the entire syllabus. University exam covers the entire syllabus of a course and hence, it is used to measure the attainment of all COs related to a course.

COs attainment is calculated through university examination result carrying 80% weightage and three internal assessments test results carrying 20% weightage. The average of all COs for a particular course C310 through internal assessment tests is calculated as 3.00 and it is converted into 20% for attainment of 3 as 0.60. In the university examination, 100% of the students scored more than the set attainment level of B+ grade in the corresponding course. Hence the attainment level is converted into 80% as 2.40 out of 3. Finally, the COs attainment of the course C310 is 3 out of 3.

3.00 *80/100 =2.40
3.00*20/100=0.60
Final COs Attainment is 3.00

CO ATTAINMENT OF ALL COURSES

(REGULATIION – 2017)

BATCH 2020 - 2024

Table.8.1 - CO attainment of all courses for the Batch: 2020 – 2024

S. NO.	Course Code	Course Name	Internal Attainment		External Attainment		Co Attainment (3 Scale)	% Of Attainment
			Level	20%	Level	80%		
1.	C101	COMMUNICATIVE ENGLISH	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
2.	C102	ENGINEERING MATHEMATICS-I	**3.00**	**0.60**	**2.00**	**1.60**	**2.20**	**73%**
3.	C103	ENGINEERING PHYSICS	**3.00**	**0.60**	**2.00**	**1.60**	**2.20**	**73%**
4.	C104	ENGINEERING CHEMISTRY	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
5.	C105	PROBLEM SOLVING AND PYTHON PROGRAMMEING	**3.00**	**0.60**	**2.00**	**1.60**	**2.20**	**73%**
6.	C106	ENGINEERING GRAPHICS	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
7.	C107	PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
8.	C108	PHYSICS AND CHEMISTRY LABORATORY	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
9.	C109	TECHNICAL ENGLISH	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
10.	C110	ENGINEERING MATHEMATICS-II	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
11.	C111	PHYSICS FOR ELECTRONICS ENGINEERING	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
12.	C112	BASIC CIVIL AND MECHNAICAL ENGINEERING	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
13.	C113	CIRCUIT THEORY	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
14.	C114	ENVIRONMENTAL SCIENCE AND ENGINEERING	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
15.	C115	ENGINEERING PRACTICES LABORATORY	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
16.	C116	ELECTRIC CIRCUITS LABORATORY	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**

S. NO.	Course Code	Course Name	Internal Attainment		External Attainment		Co Attainment (3 Scale)	% Of Attainment
			Level	20%	Level	80%		
17.	C201	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
18.	C202	DIGITAL LOGIC CIRCUITS	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
19.	C203	ELECTROMAGNETIC THEORY	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
20.	C204	ELECTRICAL MACHINES - I	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
21.	C205	ELECTRON DEVICES AND CIRCUITS	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
22.	C206	POWER PLANT ENGINEERING	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
23.	C207	ELECTRONICS LABORATORY	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
24.	C208	ELECTRICAL MACHINES LABORATORY – I	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
25.	C209	NUMERICAL METHODS	**3.00**	**0.60**	**1.00**	**0.80**	**1.40**	**47%**
26.	C210	ELECTRICAL MACHINES - II	**3.00**	**0.60**	**1.00**	**0.80**	**1.40**	**47%**
27.	C211	TRANSMISSION AND DISTRIBUTION	**3.00**	**0.60**	**1.00**	**0.80**	**1.40**	**47%**
28.	C212	MEASUREMENTS AND INSTRUMENTATION	**3.00**	**0.60**	**2.00**	**1.60**	**2.20**	**73%**
29.	C213	LINEAR INTEGRATED CIRCUITS AND APPLICATIONS	**3.00**	**0.60**	**1.00**	**0.80**	**1.40**	**47%**
30.	C214	CONTROL SYSTEMS	**3.00**	**0.60**	**1.00**	**0.80**	**1.40**	**47%**
31.	C215	ELECTRICAL MACHINES LABORATORY - II	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
32.	C216	LINEAR AND DIGITAL INTEGRATED CIRCUITS LABORATORY	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
33.	C217	TECHNICAL SEMINAR	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**

S. NO.	Course Code	Course Name	Internal Attainment		External Attainment		Co Attainment (3 Scale)	% Of Attainment
			Level	20%	Level	80%		
34.	C301	POWER SYSTEM ANALYSIS	**2.60**	**0.52**	**1.00**	**0.80**	**1.32**	**44%**
35.	C302	MICROPROCESSORS AND MICROCONTROLLERS	**3.00**	**0.60**	**1.00**	**0.80**	**1.40**	**47%**
36.	C303	POWER ELECTRONICS	**3.00**	**0.60**	**1.00**	**0.80**	**1.40**	**47%**
37.	C304	DIGITAL SIGNAL PROCESSING	**2.80**	**0.56**	**1.00**	**0.80**	**1.36**	**45%**
38.	C305	OBJECT ORIENTED PROGRAMMING	**3.00**	**0.60**	**1.00**	**0.80**	**1.40**	**47%**
39.	C306	BASICS OF BIOMEDICAL INSTRUMENTATION	**3.00**	**0.60**	**1.00**	**0.80**	**1.40**	**47%**
40.	C307	CONTROL AND INSTRUMENTATION LABORATORY	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
41.	C308	PROFESSIONAL COMMUNICATION	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
42.	C309	OBJECT ORIENTED PROGRAMMING LABORATORY	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
43.	C310	SOLID STATE DRIVES	**3.00**	**0.60**	**1.00**	**0.80**	**1.40**	**47%**
44.	C311	PROTECTION AND SWITCHGEAR	**3.00**	**0.60**	**2.00**	**1.60**	**2.20**	**73%**
45.	C312	EMBEDDED SYSTEMS	**3.00**	**0.60**	**1.00**	**0.80**	**1.40**	**47%**
46.	C313	MODERN POWER CONVERTERS	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
47.	C314	SPECIAL ELECTRICAL MACHINES	**3.00**	**0.60**	**1.00**	**0.80**	**1.40**	**47%**
48.	C315	POWER ELECTRONICS AND DRIVES LABORATORY	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
49.	C316	MICROPROCESSORS AND MICROCONTROLLERS LABORATORY	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
50.	C317	MINI PROJECT	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**

S. NO.	Course Code	Course Name	Internal Attainment		External Attainment		Co Attainment (3 Scale)	% Of Attainment
			Level	20%	Level	80%		
51.	C401	HIGH VOLTAGE ENGINEERING	**2.00**	**0.40**	**1.00**	**0.80**	**1.20**	**40%**
52.	C402	POWER SYSTEM OPERATION AND CONTROL	**3.00**	**0.60**	**1.00**	**0.80**	**1.40**	**47%**
53.	C403	RENEWABLE ENERGY SYSTEMS	**2.80**	**0.56**	**1.00**	**0.80**	**1.36**	**45%**
54.	C404	TESTING OF MATERIALS	**2.60**	**0.52**	**1.00**	**0.80**	**1.32**	**44%**
55.	C405	FIBRE OPTICS AND LASER INSTRUMENTATION	**2.60**	**0.52**	**1.00**	**0.80**	**1.32**	**44%**
56.	C406	POWER SYSTEMS TRANSIENTS	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
57.	C407	POWER SYSTEM SIMULATION LABORATORY	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
58.	C408	RENEWABLE ENERGY SYSTEMS LABORATORY	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**
59.	C409	PRINCIPLE OF MANAGEMENT	**1.60**	**0.32**	**2.00**	**1.60**	**1.92**	**64%**
60.	C410	SMART GRID	**2.30**	**0.46**	**1.00**	**0.80**	**1.26**	**42%**
61.	C411	PROJECT WORK	**3.00**	**0.60**	**3.00**	**2.40**	**3.00**	**100%**

Table 8.1. COs Attainment for all the course

ASSESSMENT TOOLS FOR POs / PSOs ATTAINMENT

9. ASSESSMENT TOOLS FOR ATTAINMENT OF PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES

PO Assessment for PO1 to PO5 is done by giving 80 % weightage to direct assessment and 20% weightage to indirect assessment tools as shown in Fig.9.1. and the process is given in Table 91.

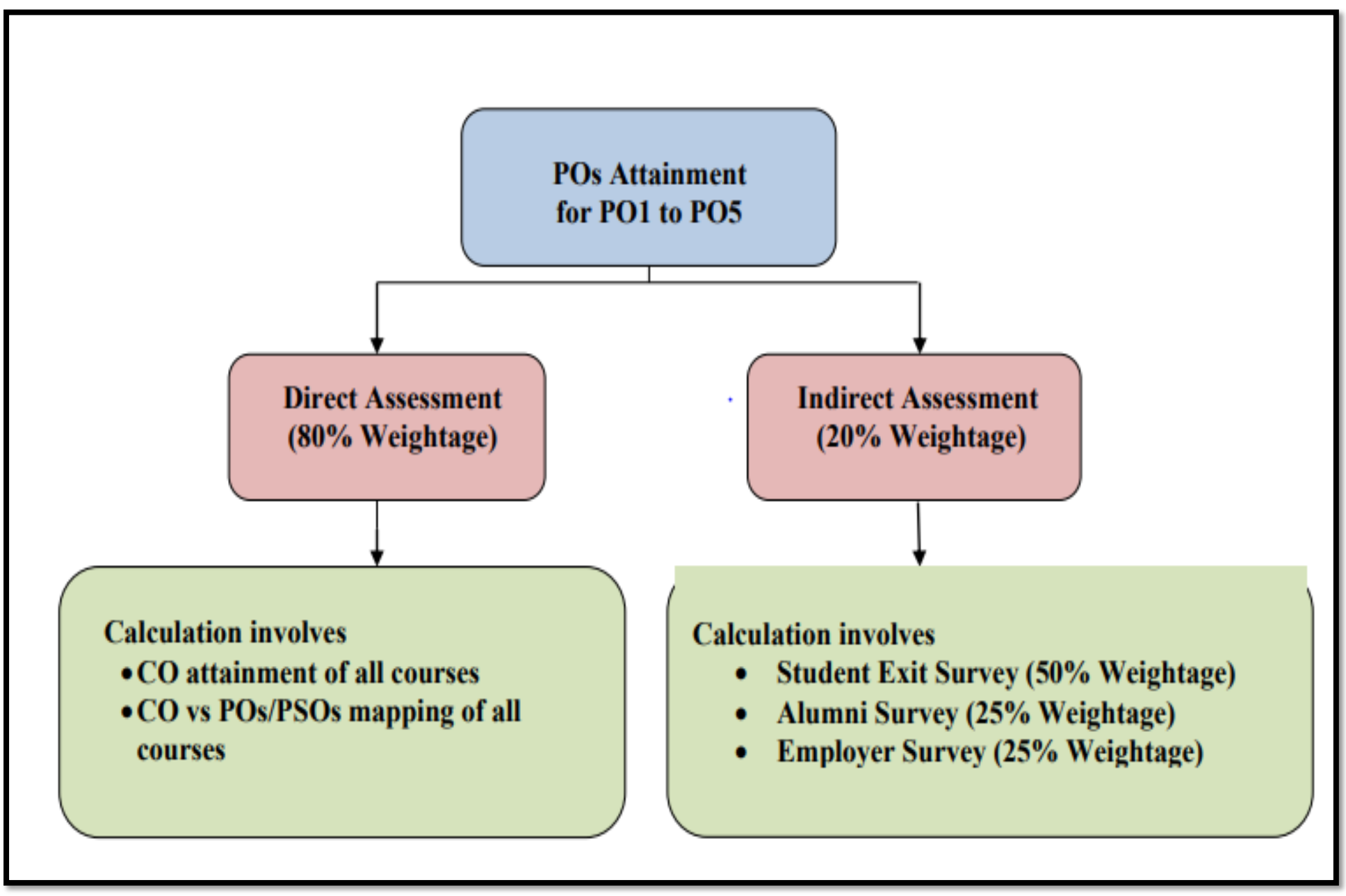


Figure 9.1 Assessment Tools for PO1 to PO5 Attainment and processes

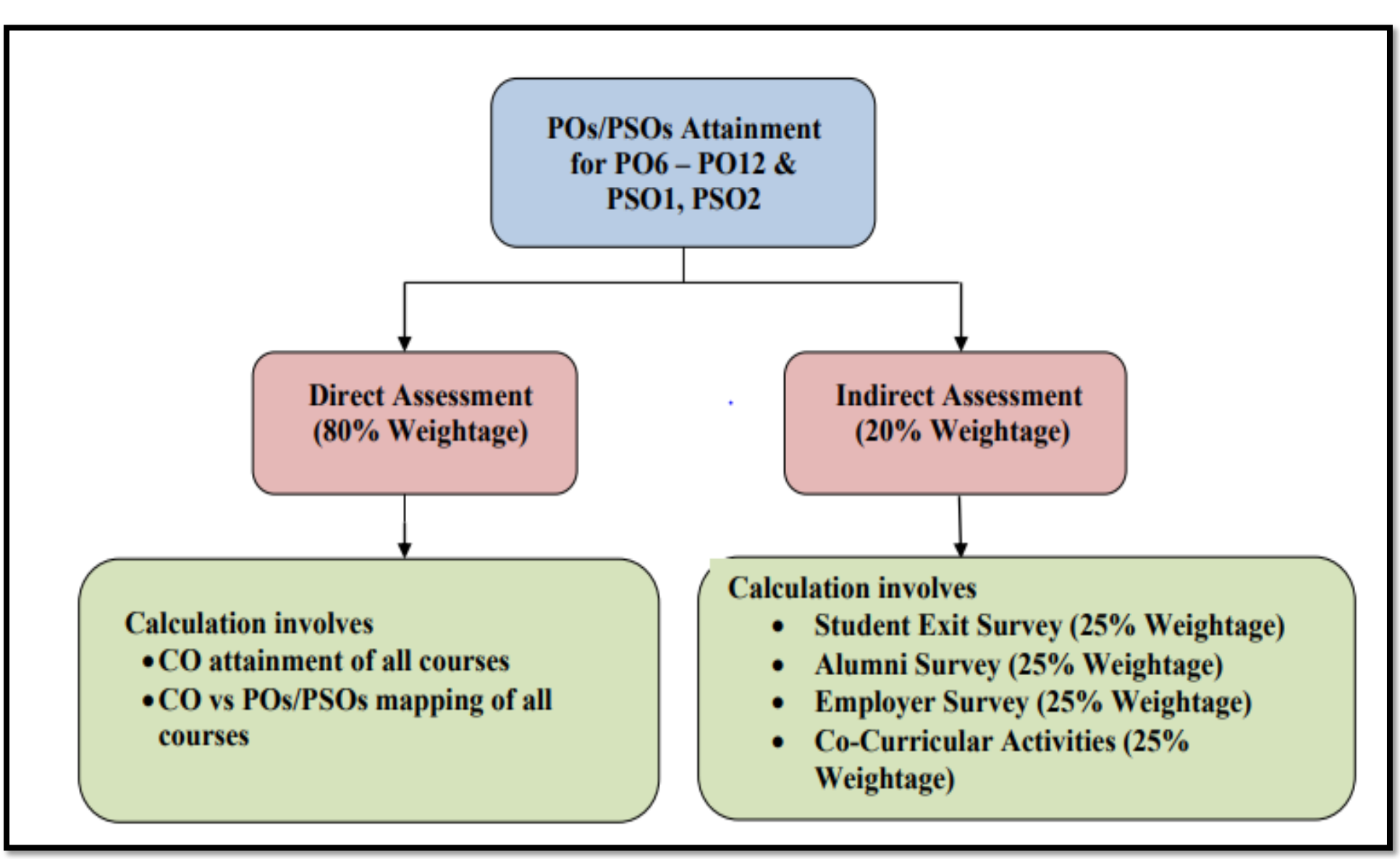


Figure 9.2 Assessment Tools for PO6 to PO12 Attainment and processes

Table 9.1. POs/PSOs Assessment Tools and Process,

POs / PSOs ASSESSMENT TOOLS AND PROCESSES				
Direct Assessment	**COs Assessment**	**Course type**	**Process of Assessment**	**Data Collection Frequency**
		Theory Course	Internal Assessment Test	3 / Course
			University Examination	1 / Course
		Practical Course	Model Practical Examination	1 / Course
			University Examination	1 / Course
		Project	Zeroth Review	1 / Course
			First Review	1 / Course
			Second Review	1 / Course
			Third Review	1 / Course
			University Viva-Voce Examination	1 / Course
Indirect Assessment	**Surveys**	Student Exit Survey		Once in a year
		Employer Survey		Once in a year
		Alumni Survey		Once in a year

Table 9.1. PO & PSOs Assessment tools

Table 9.2 – Rubrics for C0- Curricular Activities

S. NO.	CO- CURRICULAR ACTIVITIES	LOW (1)	MEDIUM (2)	HIGH (3)
1	Guest Lectures / Technical Seminars / Webinar / Workshop / Symposium	Organized 0-3 Programmes	Organized 4-6 Programmes	Organized more than 6 Programmes
2	Value Added Courses	Organized 0-2 Programmes	Organized 3-4 Programmes	Organized 4 Programmes
3	Internship / In-plant Training/ Industrial Visit	10-25% of students participated	26-50% of students participated	More than 50% of students participated
4	Programme on Ethics/Entrepreneurship/IPR	Organized 0-1 Programmes	Organized 2-3 Programmes	Organized more than 4 Programmes

SAMPLE POs/PSOs ATTAINMENT CALCULATION

10. Sample POs/PSOs Attainment Calculation

Direct assessment for POs/POs attainment calculation is based on CO attainment and Course vs POs/PSOs mapping average of all respective courses

Calculation of POs and PSOs Attainment

Attainment Level through Direct Assessment = **(0.8 x Attainment level based on University Examination Marks) + (0.2 x Attainment level based on Internal Assessment Marks)**

POs / PSOs Attainment Level for a Course

$$\text{POs / PSOs Attainment} = \frac{\text{CO Vs POs/PSOs Mapping Average of the course}}{3} \times \text{CO Attainment of the Course}$$

Overall POs / PSOs Attainment

Overall POs/PSOs Attainment = **(80% of Direct Assessment) + (20% of Indirect Assessment)**

COURSE CODE & NAME : 203 & ELECTROMAGNETIC FIELD THEORY

C310	INT. EXAM1	INT. EXAM 2	MODEL EXAM	IAT	UNIV
CO1	3	0	3	3.00	3
CO2	3	0	3	3.00	3
CO3	0	3	3	3.00	3
CO4	0	3	3	3.00	3
CO5	0	0	3	3.00	3
INTERNAL/UNIV ATTAINMENTS				3.00	3.00
WEIGHTAGE				20%	80%
CO ATTAINTMENT FOR THE COURSE				0.60	2.40
FINAL CO ATTAINTMNET FOR THE COURSE				**3.00**	

CO Vs PO														
COURSE	**ELECTROMAGNETIC FIELD THEORY**													
COURSE COUTCOME	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C301.1	**3**	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**
C301.2	**3**	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**
C301.3	**2**	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**
C301.4	**3**	**3**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**3**
C301.5	**3**	**3**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**3**
C301	**2.80**	**3.00**	**2.60**	**2.60**	**2.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.00**	**3.00**
POs / PSOs ATTAINMENT	**2.80**	**3.00**	**2.60**	**2.60**	**2.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.00**	**3.00**

SURVEY ANALYSIS

11. Survey Analysis

POs/PSOs Attainment through Indirect Assessment:

The feedback about curriculum and the ways to improve the POs/PSOs attainment is collected in the form of Survey from stakeholders. Indirect assessment is done through student exit survey (50% weightage), Alumni survey (25% weightage) and Employer survey (25% weightage).

STUDENTS EXIT SURVEY

SNO	QUESTIONS	EXCELENT	VERY GOOD	GOOD	FAIR	POOR	TOTAL	%	SCALE
	MAX. VALUE	**5**	**4**	**3**	**2**	**1**	**75**	**100**	**3**
1	PO1	**32**	**1**	**0**	**0**	**0**	164	**96.47%**	**2.89**
2	PO2	**31**	**3**	**0**	**0**	**0**	167	**98.24%**	**2.95**
3	PO3	**26**	**8**	**0**	**0**	**0**	162	**95.29%**	**2.86**
4	PO4	**25**	**8**	**1**	**0**	**0**	160	**94.12%**	**2.82**
5	PO5	**24**	**9**	**1**	**0**	**0**	159	**93.53%**	**2.81**
6	PO6	**24**	**7**	**3**	**0**	**0**	157	**92.35%**	**2.77**
7	PO7	**29**	**3**	**2**	**0**	**0**	163	**95.88%**	**2.88**
8	PO8	**27**	**7**	**0**	**0**	**0**	163	**95.88%**	**2.88**
9	PO9	**26**	**7**	**1**	**0**	**0**	161	**94.71%**	**2.84**
10	PO10	**30**	**4**	**0**	**0**	**0**	166	**97.65%**	**2.93**
11	PO11	**28**	**5**	**1**	**0**	**0**	163	**95.88%**	**2.88**
12	PO12	**32**	**1**	**0**	**0**	**0**	164	**96.47%**	**2.89**
13	PSO1	**32**	**2**	**0**	**0**	**0**	168	**98.82%**	**2.96**
14	PSO2	**33**	**1**	**0**	**0**	**0**	169	**99.41%**	**2.98**
OVER ALL %		**480**	**66**	**9**	**0**	**0**	**455**	**81.25%**	**2.8**

ALUMNI SURVET

SNO	QUESTIONS	EXCELENT	VERY GOOD	GOOD	FAIR	POOR	TOTAL	%	SCALE
	MAX. VALUE	**5**	**4**	**3**	**2**	**1**	**80**	**100**	**3**
1	PO1	**15**	**1**	**0**	**0**	**0**	79	**98.75%**	**2.96**
2	PO2	**14**	**2**	**0**	**0**	**0**	78	**97.50%**	**2.93**
3	PO3	**14**	**1**	**1**	**0**	**0**	77	**96.25%**	**2.89**
4	PO4	**13**	**2**	**1**	**0**	**0**	76	**95.00%**	**2.85**
5	PO5	**13**	**1**	**2**	**0**	**0**	75	**93.75%**	**2.81**
6	PO6	**13**	**2**	**1**	**0**	**0**	76	**95.00%**	**2.85**
7	PO7	**13**	**1**	**2**	**0**	**0**	75	**93.75%**	**2.81**
8	PO8	**14**	**1**	**0**	**0**	**0**	74	**92.50%**	**2.78**
9	PO9	**14**	**0**	**1**	**0**	**0**	73	**91.25%**	**2.74**
10	PO10	**13**	**1**	**1**	**0**	**0**	72	**90.00%**	**2.70**
11	PO11	**14**	**0**	**1**	**0**	**0**	73	**91.25%**	**2.74**
12	PO12	**15**	**0**	**0**	**0**	**0**	75	**93.75%**	**2.81**
13	PSO1	**14**	**1**	**0**	**0**	**0**	74	**92.50%**	**2.78**
14	PSO2	**13**	**1**	**1**	**0**	**0**	72	**90.00%**	**2.70**
OVER ALL %		**318**	**126**	**41**	**5**	**0**	**490**	**94.29%**	**2.83**

EMPLOYER SURVEY

SNO	QUESTIONS	EXCELENT	VERY GOOD	GOOD	FAIR	POOR	TOTAL	%	SCALE
	MAX. VALUE	**5**	**4**	**3**	**2**	**1**	**40**	**100**	**3**
1	PO1	**7**	**1**	**0**	**0**	**0**	39	**97.50%**	**2.93**
2	PO2	**6**	**2**	**0**	**0**	**0**	38	**95.00%**	**2.85**
3	PO3	**6**	**2**	**0**	**0**	**0**	38	**95.00%**	**2.85**
4	PO4	**6**	**1**	**1**	**0**	**0**	37	**92.50%**	**2.78**
5	PO5	**7**	**1**	**0**	**0**	**0**	39	**97.50%**	**2.93**
6	PO6	**6**	**2**	**0**	**0**	**0**	38	**95.00%**	**2.85**
7	PO7	**6**	**1**	**1**	**0**	**0**	37	**92.50%**	**2.78**
8	PO8	**7**	**1**	**0**	**0**	**0**	39	**97.50%**	**2.93**
9	PO9	**7**	**1**	**0**	**0**	**0**	39	**97.50%**	**2.93**
10	PO10	**7**	**1**	**0**	**0**	**0**	39	**97.50%**	**2.93**
11	PO11	**8**	**0**	**0**	**0**	**0**	40	**100.00%**	**3.00**
12	PO12	**8**	**0**	**0**	**0**	**0**	40	**100.00%**	**3.00**
13	PSO1	**7**	**1**	**0**	**0**	**0**	39	**97.50%**	**2.93**
14	PSO2	**7**	**1**	**0**	**0**	**0**	39	**97.50%**	**2.93**
OVER ALL %		**113**	**26**	**1**	**0**	**0**	**140**	**96.61%**	**2.90**

POs/PSOs ATTAINMENT TABLE FOR ALL COURSES

12. POs/PSOs Attainment Table for all courses through direct assessment

POs/PSOs Attainment for all courses through direct assessment tools is given in Table 12.1

PO ATTAINMENT TABLE														
CO VS POs/PSOs MAPPING AVERAGE														
COURSE CODE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C101	-	-	-	-	-	-	-	2.00	2.20	3.00	-	3.00	-	-
C102	2.20	2.20	0.88	-	-	-	-	-	-	-	1.47	1.47	-	-
C103	1.76	1.17	-	-	0.73	-	-	-	-	-	-	0.73	-	-
C104	2.00	1.00	1.67	-	1.40	1.60	1.50	-	-	1.25	-	1.00	-	-
C105	2.20	1.91	1.91	1.47	1.71	-	-	-	-	-	-	1.47	-	-
C106	1.00	1.00	2.00	1.00	-	-	-	-	-	2.00	-	2.00	-	-
C107	3.00	2.40	2.20	2.00	2.00	-	-	-	2.33	2.00	2.00	2.00	-	-
C108	2.60	2.00	-	-	-	-	2.67	-	-	-	-	1.00	-	-
C109	-	-	-	-	-	-	-	1.80	2.60	3.00	-	3.00	-	-
C110	3.00	3.00	1.80	-	1.00	-	-	-	-	-	1.50	2.00	-	-
C111	2.40	1.50	-	-	1.67	-	-	-	-	-	-	1.00	-	-
C112	2.00	1.00	1.00	1.50	1.50	-	3.00	-	3.00	-	-	-	-	-
C113	3.00	2.00	2.00	2.00	-	-	-	-	3.00	-	-	-	1.00	2.00
C114	2.00	-	-	-	-	1.40	3.00	-	2.20	-	-	1.00	-	-
C115	1.00	1.00	2.00	1.00	-	-	-	-	-	2.00	-	2.00	2.00	2.20
C116	3.00	2.00	3.00	-	-	-	-	-	3.00	3.00	-	3.00	3.00	2.00

PO ATTAINMENT TABLE														
CO VS POs/PSOs MAPPING AVERAGE														
COURSE CODE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C201	3.00	2.80	3.00	-	3.00	-	-	-	-	-	2.50	2.00	2.00	2.00
C202	2.80	3.00	3.00	2.60	1.60	-	-	-	-	-	-	-	2.00	3.00
C203	2.80	3.00	2.60	2.60	2.00	-	-	-	-	-	-	-	2.00	3.00
C204	3.00	2.80	2.80	2.60	-	-	-	-	-	-	-	2.00	2.00	3.00
C205	2.40	2.80	2.67	2.00	-	-	-	-	-	-	-	-	1.33	2.00
C206	3.00	2.80	2.60	2.25	2.00	3.00	3.00	3.00	-	-	-	2.60	2.00	2.00
C207	3.00	3.00	3.00	-	2.20	-	-	-	2.00	2.00	-	-	3.00	3.00
C208	3.00	3.00	2.40	2.00	2.00	3.00	-	-	2.00	2.00	-	-	1.00	3.00
C209	1.40	1.40	0.47	-	1.09	0.93	-	-	-	-	-	1.05	0.93	0.93
C210	1.40	1.40	1.31	1.12	-	-	0.47	-	-	-	-	-	0.93	0.93
C211	1.40	1.40	1.31	0.93	0.93	-	-	0.47	0.47	0.93	1.40	-	0.93	0.93
C212	2.20	2.05	1.76	1.71	2.20	1.47	-	-	-	-	-	-	1.47	1.47
C213	1.40	1.21	1.03	0.93	-	-	-	-	-	-	-	-	1.17	0.93
C214	1.40	1.21	1.12	0.93	0.93	-	-	-	-	-	-	-	0.93	0.93
C215	3.00	3.00	3.00	2.00	-	-	-	-	2.00	2.00	-	-	2.00	3.00
C216	3.00	3.00	3.00	2.00	2.00	-	-	-	2.00	2.00	-	-	2.00	3.00
C217	3.00	3.00	-	2.60	2.40	1.60	-	1.60	2.20	2.20	3.00	3.00	3.00	3.00

PO ATTAINMENT TABLE														
CO VS POs/PSOs MAPPING AVERAGE														
COURSE CODE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C301	1.32	1.32	1.14	1.14	1.10	-	-	-	-	-	-	-	0.88	0.88
C302	1.40	1.40	1.12	1.40	1.17	-	-	-	-	-	-	-	1.40	0.93
C303	1.40	1.31	1.21	1.40	1.05	-	-	-	-	-	-	-	0.93	0.93
C304	1.36	1.27	1.09	1.36	0.91	-	-	-	-	-	-	-	0.91	0.91
C305	1.40	0.65	0.84	0.93	-	-	-	-	-	-	-	0.93	0.47	0.93
C306	1.40	1.21	1.03	-	0.93	-	-	-	-	-	-	-	0.93	0.93
C307	3.00	3.00	3.00	-	3.00	-	-	-	2.00	2.00	-	3.00	3.00	3.00
C308	-	-	-	-	-	-	-	2.00	3.00	3.00	-	3.00	-	-
C309	3.00	3.00	3.00	-	-	-	-	-	2.00	1.00	-	2.00	2.00	2.00
C310	1.40	1.12	1.12	1.17	0.93	-	-	-	-	-	-	0.93	0.93	0.93
C311	2.05	2.05	2.02	1.47	1.47	-	-	-	-	-	-	-	1.47	1.47
C312	1.40	1.21	1.12	1.40	1.17	-	-	-	-	-	-	-	1.09	0.93
C313	3.00	2.80	3.00	3.00	3.00	-	-	-	-	-	-	-	2.00	2.00
C314	1.40	1.31	0.93	0.93	0.93	-	-	-	-	-	-	-	0.93	0.93
C315	3.00	3.00	3.00	3.00	3.00	-	-	-	3.00	3.00	-	3.00	3.00	3.00
C316	3.00	3.00	3.00	3.00	3.00	-	-	-	3.00	3.00	-	3.00	2.00	3.00
C317	3.00	3.00	3.00	3.00	-	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

PO ATTAINMENT TABLE														
CO VS POs/PSOs MAPPING AVERAGE														
COURSE CODE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C401	1.20	1.04	0.88	0.80	0.80	-	-	-	-	-	-	0.80	1.20	0.80
C402	1.40	1.40	1.21	1.09	0.93	1.40	0.62	-	-	-	-	1.40	1.21	1.40
C403	1.36	1.09	1.13	1.13	0.91	1.36	0.91	-	-	-	-	1.36	1.36	1.36
C404	1.32	0.88	1.32	-	-	-	-	-	-	0.44	-	0.88	1.32	0.88
C405	1.32	1.14	1.32	-	0.44	-	-	-	-	-	-	1.32	1.32	0.88
C406	3.00	3.00	3.00	3.00	3.00	-	-	-	-	-	-	3.00	3.00	2.00
C407	3.00	3.00	3.00	3.00	-	-	-	3.00	3.00	3.00	-	3.00	3.00	3.00
C408	3.00	3.00	3.00	3.00	3.00	-	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
C409	-	-	-	-	-	-	-	1.28	1.28	1.28	1.28	1.28	-	-
C410	1.26	1.18	1.12	-	-	-	-	0.84	0.70	-	-	0.84	0.84	0.84
C411	3.00	3.00	3.00	3.00	3.00	-	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

POs/PSOs attainment for Co-curricular activities is given in Table 12.2

Co- Curricular Activities	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Guest Lectures / Technical Seminars / Webinar / Workshop / Symposium	2.00	2.00	2.00	3.00	3.00	1.00	2.00	2.00	2.00
Value Added Courses	2.00	2.00	2.00	3.00	3.00	1.00	2.00	3.00	3.00
Internship / In-plant Training/ Industrial Visit	3.00	3.00	3.00	3.00	3.00	3.00	2.00	2.00	2.00
Programme on Ethics/Entrepreneurship/IPR	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Average	2.25	2.25	2.25	2.75	2.75	1.75	2.00	2.25	2.25
Weightage 25%	0.5625	0.56	0.56	0.69	0.69	0.44	0.5	0.56	0.56

PO1 to PO5 attainment for all courses is given in Table 12.3

SNO	INDIRECT SURVEY	Assessment Weightage	PO1	PO2	PO3	PO4	PO5
1	Student Exit Survey	50%	1.48	1.46	1.44	1.42	1.44
2	Alumni Survey	25%	0.74	0.73	0.72	0.71	0.70
3	Employer Survey	25%	0.73	0.71	0.71	0.69	0.73
Indirect			2.95	2.90	2.87	2.83	2.87

PO6 to PO12 & PSO1, PSO2 attainment for all courses is given in Table 12.4

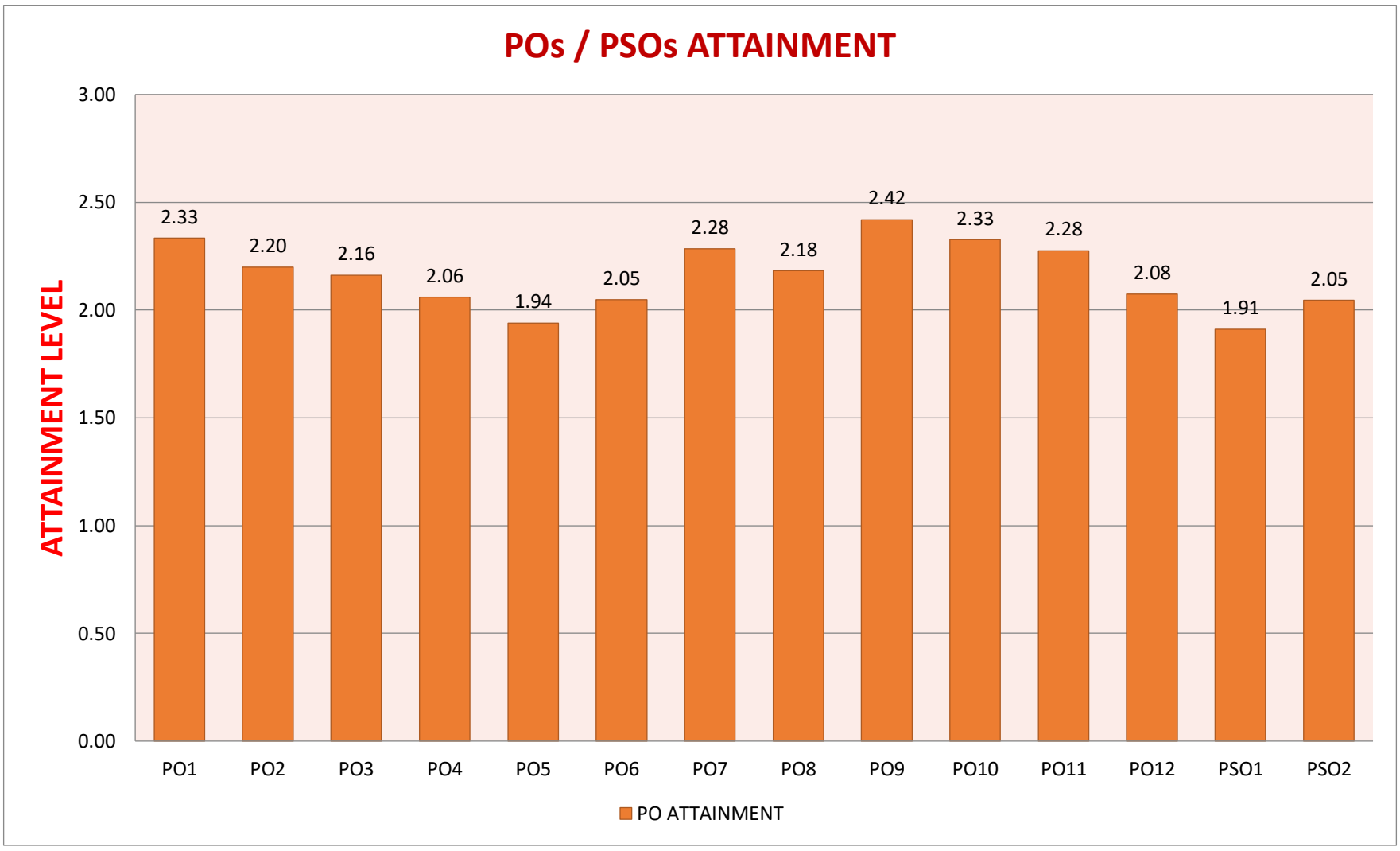
SNO	INDIRECT SURVEY	Assessment Weightage	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	Student Exit Survey	25%	0.69	0.72	0.72	0.71	0.73	0.72	0.72	0.74	0.75
2	Alumni Survey	25%	0.71	0.70	0.69	0.68	0.68	0.68	0.70	0.69	0.68
3	Employer Survey	25%	0.71	0.69	0.73	0.73	0.73	0.75	0.75	0.73	0.73
4	Co-Curricular	25%	0.56	0.56	0.56	0.69	0.69	0.44	0.50	0.56	0.56
Indirect			2.68	2.68	2.71	2.81	2.83	2.59	2.68	2.73	2.71

Table 12.4

The Overall POs/PSOs attainment from direct and indirect assessment as below,

ASSESSMENT TYPE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
DIRECT	2.19	2.01	1.96	1.84	1.69	1.88	2.20	2.08	2.33	2.21	2.21	1.95	1.72	1.85
INDIRECT	2.91	2.96	2.95	2.95	2.92	2.74	2.63	2.58	2.77	2.78	2.52	2.58	2.70	2.81
DIRECT 80%	1.75	1.61	1.57	1.47	1.36	1.50	1.76	1.67	1.87	1.77	1.77	1.56	1.37	1.48
INDIRECT 20%	0.58	0.59	0.59	0.59	0.58	0.55	0.53	0.52	0.55	0.56	0.50	0.52	0.54	0.56
OVER ALL ATTAINMENT	2.33	2.20	2.16	2.06	1.94	2.05	2.28	2.18	2.42	2.33	2.28	2.08	1.91	2.05

POs / PSOs ATTAINMENT CHART



Annexure -I
Department POs & PSOs

PROGRAM OUTCOMES

Program Outcomes (POs):		
PO1	**Engineering knowledge**	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**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.
PO3	**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.
PO4	**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
PO5	**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.
PO6	**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.
PO7	**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.
PO8	**Ethics**	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and team work**	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**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.
PO11	**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.
PO12	**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 OUTCOMES (PSOs):

STATEMENTS	
PSO 1	Apply the modern tools and provide solutions for the real time problems related to energy conservation.
PSO 2	Apply, develop and design the electrical and electronics systems used in power control applications and renewable energy industries with ethical standards.

Annexure -II
SURVEY FORMS

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

STUDENT EXIT SURVEY

Name of the Student :

Registration Number :

Contact Number :

Email :

Batch :

POs /PSOs	Questions	Ratings				
		Excellent (5)	Very Good (4)	Good (3)	Fair (2)	Poor (1)
PO1	To what level you are able to apply science and engineering concepts to problem solving?					
PO2	To what extent you are able to analyze Electrical and Electronics Engineering problems?					
PO3	To what extent you are able to design solutions for complex engineering problems?					
PO4	To what extent you are able to analyze and interpret data?					
PO5	To what extent you are able to use state of the art tools for Electrical and Electronics Engineering applications?					
PO6	To what extent you are able to apply the knowledge to solve the societal issues?					
PO7	To what extent you are able to apply the knowledge to find the solution for global and sustained development?					
PO8	To what extent you are able to develop awareness of professional, ethical and social responsibilities?					
PO9	To what extent you are able to function as an individual or leader in multidisciplinary teams in projects implementation?					
PO10	To what extent you are able to communicate for engineering activities and presentation?					
PO11	To what extent you are able to demonstrate knowledge and understanding engineering and management principles to deal with projects?					
PO12	To what extent you are able to engage in life-long learning and adapt to rapidly changing technologies?					
PSO1	To what extent you are able to apply modern tools and provide solutions for real time for energy conservation?					
PSO2	To what extent you are able to develop the simulation and control application in renewable industry with ethics?					

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

EMPLOYER SURVEY

Name of the Organization:

Name of the Employer and Designation:

Name of the Employee:

Please provide your comments on the following:

1. The curriculum covers all the requisite knowledge content suitable for employment.
   - Excellent
   - Very Good
   - Good
   - Average
   - Fair

2. Analysis of critical real time problems.
   - Excellent
   - Very Good
   - Good
   - Average
   - Fair

3. Design and development of systems, models and processes.
   - Excellent
   - Very Good
   - Good
   - Average
   - Fair
4. Research based knowledge including analysis and problem solving abilities to arrive at feasible solutions.
   - Excellent
   - Very Good
   - Good
   - Average
   - Fair

5. The curriculum has ample scope for developing recruitee's ability to apply their knowledge, skills and modern tools and software for appropriate solutions in the assigned project domain
   - Excellent
   - Very Good
   - Good
   - Average
   - Fair

6. The recruitee's sensitivity to social needs in bringing innovative proposal and ideas.
   - Excellent
   - Very Good
   - Good
   - Average
   - Fair

7. The awareness to environmental issues, if any while implementing the project.
   - Excellent
   - Very Good
   - Good
   - Average
   - Fair

8. The commitment and ethical values of the Recruitee
    - Excellent
    - Very Good
    - Good
    - Average
    - Fair

9. The individual skills and contribution to the Recruitee's team in the project.
    - Excellent
    - Very Good
    - Good
    - Average
    - Fair

10. Curricular components – projects, seminars help the students in gaining skills to prepare project proposals and reports.
    - Excellent
    - Very Good
    - Good
    - Average
    - Fair

11. The curriculum has ample scope for developing recruitee's ability to apply managerial, administrative principles with financial literacy for successful project execution.
    - Excellent
    - Very Good
    - Good
    - Average
    - Fair

12. Recruitee's enthusiasm to upgrade the skill set and knowledge for new assignments and professional development.
    - Excellent
    - Very Good
    - Good
    - Average
    - Fair

13. Broad curricular areas help the student in gaining knowledge for securing a job and subsequent progression.
    - Excellent
    - Very Good
    - Good
    - Average
    - Fair

14. Modern tools in curriculum are contemporary enough to suit the needs of the organization.
    - Excellent
    - Very Good
    - Good
    - Average
    - Fair

EMPLOYER SURVEY

Name of the Organization:

Name of the Employer and Designation:

Name of the Employee:

Please provide your comments on the following::

POs /PSOs	Questions	Ratings				
		Excellent (5)	Very Good (4)	Good (3)	Fair (2)	Poor (1)
PO1	The curriculum covers all the requisite knowledge content suitable for employment.					
PO2	Analysis of critical real time problems					
PO3	Design and development of systems, models and processes.					
PO4	Research based knowledge including analysis and problem solving abilities to arrive at feasible solutions.					
PO5	The curriculum has ample scope for developing recruitee's ability to apply their knowledge, skills and modern tools and software for appropriate solutions in the assigned project domain					
PO6	The recruiter's sensitivity to social needs in bringing innovative proposal and ideas.					
PO7	The awareness to environmental issues, if any while implementing the project.					
PO8	The commitment and ethical values of the Recruiter					
PO9	The individual skills and contribution to the Recruiter's team in the project.					
PO10	Curricular components – projects, seminars help the students in gaining skills to prepare project proposals and reports.					
PO11	The curriculum has ample scope for developing recruitee's ability to apply managerial, administrative principles with financial literacy for successful project execution.					
PO12	Recruitee's enthusiasm to upgrade the skill set and knowledge for new assignments and professional development.					
PSO1	Broad curricular areas help the student in gaining knowledge for securing a job and subsequent progression.					
PSO2	Modern tools in curriculum are contemporary enough to suit the needs of the organization.					

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