ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY, PALKULAM

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

B.E. Electrical and Electronics Engineering

Anna University Regulation 2017

List of Course Names

S.No.	Sem	Course code	Course	Course Title
1.	I	17C101	HS8151	Communicative English
2.	I	17C102	MA8151	Engineering Mathematics- I
3.	I	17C103	PH8151	Engineering Physics
4.	I	17C104	CY8151	Engineering Chemistry
5.	I	17C105	GE8151	Problem Solving and Python Programming
6.	I	17C106	GE8152	Engineering Graphics
7.	I	17C107	GE8161	Problem Solving and Python Programming Laboratory
8.	I	17C108	BS8161	Physics and Chemistry Laboratory
9.	II	17C201	HS8251	Technical English
10.	II	17C202	MA8251	Engineering Mathematics- II
11.	II	17C203	PH8253	Physics for Electronics Engineering
12.	II	17C204	BE8252	Basic Civil and Mechanical Engineering
13.	II	17C205	EE8251	Circuit Theory
14.	II	17C206	GE8291	Environmental Science and Engineering
15.	II	17C207	GE8261	Engineering Practices Laboratory
16.	II	17C208	EE8261	Electric Circuits Laboratory
17.	III	17C301	MA8353	Transforms and Partial Differential Equations
18.	III	17C302	EE8351	Digital Logic Circuits
19.	III	17C303	EE8391	Electromagnetic Theory
20.	III	17C304	EE8301	Electrical Machines - I
21.	III	17C305	EC8353	Electron Devices and Circuits
22.	III	17C306	ME8792	Power Plant Engineering
23.	III	17C307	EC8311	Electronics Laboratory
24.	III	17C308	EE8311	Electrical Machines Laboratory - I
25.	IV	17C401	MA8491	Numerical Methods
26.	IV	17C402	EE8401	Electrical Machines - II
27.	IV	17C403	EE8402	Transmission and Distribution
28.	IV	17C404	EE8403	Measurements and Instrumentation
29.	IV	17C405	EE8451	Linear Integrated Circuits and Applications
30.	IV	17C406	IC8451	Control Systems
31.	IV	17C407	EE8411	Electrical Machines Laboratory - II
32.	IV	17C408	EE8461	Linear and Digital Integrated Circuits Laboratory
33.	IV	17C409	EE8412	Technical Seminar
34.	V	17C501	EE8501	Power System Analysis
35.	V	17C502	EE8551	Microprocessors and Microcontrollers
36.	V	17C503	EE8552	Power Electronics
37.	V	17C504	EE8591	Digital Signal Processing
38.	V	17C505	CS8392	Object Oriented Programming
39.	V	17C506 (OE-I)	OMD551	Basics of Biomedical Engineering
40.	V	17C506 (OE-I)	OCE551	Air Pollution Control and Engineering

41.	V	17C507	EE8511	Control and Instrumentation Laboratory
42.	V	17C508	HS8581	Professional Communication
43.	V	17C509	CS8383	Object Oriented Programming Laboratory
44.	VI	17C601	EE8601	Solid State Drives
45.	VI	17C602	EE8602	Protection and Switchgear
46.	VI	17C603	EE8691	Embedded Systems
47.	VI	17C604 (PE-I)	EE8002	Design of Electrical Apparatus
48.	VI	17C605 (PE-II)	EE8005	Special Electrical Machines
49.	VI	17C606	EE8661	Power Electronics and Drives Laboratory
50.	VI	17C607	EE8681	Microprocessors and Microcontrollers Laboratory
51.	VI	17C608	EE8611	Mini Project
52.	VII	17C701	EE8701	High Voltage Engineering
53.	VII	17C702	EE8702	Power System Operation and Control
54.	VII	17C703	EE8703	Renewable Energy Systems
55.	VII	17C704(OE-II)	OBT751	Analytical methods and Instrumentation
56.	VII	17C704(OE-II)	OML751	Testing of Materials
57.	VII	17C705 (PE-III)	EI8075	Fibre Optics and Laser Instrumentation
58.	VII	17C706 (PE-IV)	EE8009	Control of Electrical Drives
59.	VII	17C707	EE8711	Power System Simulation Laboratory
60.	VII	17C708	EE8712	Renewable Energy Systems Laboratory
61.	VIII	17C801 (PE-V)	EE8015	Electric Energy Generation, Utilization and Conservation
62.	VIII	17C802 (PE-VI)	EE8017	High Voltage Direct Current Transmission
63.	VIII	17C803	EE8811	Project Work

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

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COURSE OUTCOMES (CO)

17C101- HS8151 COMMUNICATION ENGLISH

17C101.1	Construct dialogues for informal conversations and make a lead in group; introduce themselves and their friends and express opinions in English.
17C101.2	Develop general comprehending skills and present lucid skills in free writing.
17C101.3	Make use of the basic grammar techniques and utilize it in enhancing language development
17C101.4	Outline informal, personal letters and emails in English.
17C101.5	Extend the proficiency in writing short essays and relate main and subordinate ideas to improve the writing skill.

17C102- MA8151 ENGINEERINGMATHEMATICS- I

17C102.1	Identify maxima or minima of functions of one variable using differentiation.
17C102.2	Identify maxima or minima in two variables using partial differentiation.
17C102.3	Solve proper and improper integrals.
17C102.4	Apply multiple integral techniques in evaluating Area and Volume of Solids
17C102.5	Solve differential equations in Engineering problems.

17C103- PH8151 ENGINEERING PHYSICS

17C103.1	Illustrate basic concepts of stress and strain in solids
17C103.2	Classify the type of optical fiber and Laser
17C103.3	Infer about the transfer of heat energy and its applications
17C103.4	Illustrate the quantum theory and its applications
17C103.5	Outline the various crystal structure and its growth techniques

17C104 CY8151 ENGINEERING CHEMISTRY

17C104.1	Summarize the water related problems in boilers and their treatment techniques.
17C104.2	Explain the concept and need of catalysis.
17C104.3	Apply the chemical properties to categorize the engineering materials and their uses.
17C104.4	Illustrate the quality of fuel by its properties.
17C104.5	Illustrate the methods of harnessing energy from non-conventional energy sources.

17C105 GE8151 PROBLEM SOLVING ANDPYTHON PROGRAMMING

17C105.1	Explain algorithmic solutions to simple computational problems.
17C105.2	Explain simple Python statements and expressions.
17C105.3	Apply control flow and functions concept in Python for solving problems
17C105.4	Understand – lists, tuples & dictionaries for representing compound data
17C105.5	Apply files, exception, modules and packages in Python for solving problems

17C106- GE8152 ENGINEERING GRAPHICS

17C106.1	Discuss the orthographic views of Engineering components.
17C106.2	Relate to basic principles of orthographic projection for drawing projection of points, lines and planes.
17C106.3	Apply basic principles of orthographic projection for drawing projection of solids like prisms, pyramids, cone and cylinder.
17C106.4	Show the sectioned view of solids and the development of solid surfaces
17C106.5	Show the isometric projection and perspective views for simple solids.

17C107 GE8161 PROBLEM SOLVING ANDPYTHON PROGRAMMING LABORATORY

17C107.1	Apply basic concepts and simple Python programs.
17C107.2	Explain Python programs with conditionals and loops.
17C107.3	Apply function definition and recursion in Python program.
17C107.4	Apply Python lists, tuples, and dictionaries for representing compound data.
17C107.5	Apply Read and write data from/to files in python program.
17C107.6	Exhibit ethical principles in engineering practices
17C107.7	Perform task as an individual and / or team member to manage the task in time
17C107.8	Express the Engineering activities with effective presentation and report
17C107.9	Interpret the findings with appropriate technological / research citation.

17C108 BS8161 PHYSICS AND CHEMISTRYLABORATORY

17C108.1	Explain the physical parameters such as thickness of a wire, band gap of semiconductor both individually and by team by using experiments
17C108.2	Compare the Young's modulus and Rigidity modulus of different materials
17C108.3	List the velocity of ultrasonic waves in different liquids like water and kerosene
17C108.4	Estimate strength of acids quantitatively based on the conductance and PH level of the solution both individually and in teams
17C108.5	Estimate water quality parameters such as dissolved oxygen content, chloride content and iron content of the water samples both individually and in teams
17C108.6	Exhibit ethical principles in engineering practices
17C108.7	Perform task as an individual and / or team member to manage the task in time
17C108.8	Express the Engineering activities with effective presentation and report
17C108.9	Interpret the findings with appropriate technological / research citation.

17C201 HS8251 TECHNICAL ENGLISH

17C201.1	Interpret the passage listened from talk and comprehension.
17C201.2	Rephrase the paragraph of talks and comprehension passages after reading and Interpret charts and graphs.
17C201.3	Develop their speaking skills to make technical presentation
17C201.4	Summarize, resume, analytical and issue-based essays.
17C201.5	Summarize reports and minutes of meeting suitably

17C202 MA8251 ENGINEERING MATHEMATICS - II

17C202.1	Apply the concept of orthogonal transformation to diagonalise the given matrix
17C202.2	Solve line integral, surface integral and volume integral in Engineering applications.
17C202.3	Relate analytic functions by Milne's Thomson method.
17C202.4	Solve real definite integrals as contour integrals around unit circle and semi-circle
17C202.5	Solve the second order ODE by Laplace transformation.

17C203 PH8253 PHYSICS FOR ELECTRONICS ENGINEERING

17C203.1	Infer the electrical properties of material.
17C203.2	Classify the type of semiconductor and its uses.
17C203.3	Outline the magnetic and dielectric properties of different materials.
17C203.4	Explain the optical properties of materials
17C203.5	Interpret the nano devices and its applications

17C204 BE8252 BASIC CIVIL AND MECHANICAL ENGINEERING

17C204.1	Explain basic concepts of Civil and Mechanical Engineering
17C204.2	Select the materials and measurement techniques used in Civil Engineering
17C204.3	Summarize the fundamental building components and Civil Engineering structures.
17C204.4	Illustrate various IC engines and Power plant system and sub-systems with layout.
17C204.5	Experiment with typical domestic refrigerator and different types of room Air conditioner

17C205 EE8251 CIRCUIT THEORY

17C205.1	Apply the concept of Kirchhoff's law on electrical circuits
17C205.2	Analyze various network theorems for solving AC and DC circuits.
17C205.3	Analyze resonance in magnetically coupled circuits.

17C205.4	Analyze the transient response of a.c and d,c excited elements.
17C205.5	Analyze star and delta load connected three phase circuits.

17C206 GE8291 ENVIRONMENTAL SCIENCE ANDENGINEERING

17C206.1	Apply the concept of Kirchhoff's law on electrical circuits
17C206.2	Analyze various network theorems for solving AC and DC circuits.
17C206.3	Analyze resonance in magnetically coupled circuits.
17C206.4	Analyze the transient response of a.c and d,c excited elements.
17C206.5	Analyze star and delta load connected three phase circuits.

17C207 EC8311-ELECTRONICS LABORATORY	
17C207.1	Analyze the PN junction diode acts as a perfect switch and Zener diode acts as voltage regulator.
17C207.2	Analyze the characteristics of a voltage-controlled device.
17C207.3	Design an experiment and determine the frequency response of common emitter amplifier
17C207.4	Design and implement a circuit that converts AC voltage to DC voltage for the given input and calculate its ripple factor and percentage of regulation with and without capacitive and inductive filter
17C207.5	Analyze the sine, square and triangular waveforms using cathode ray oscilloscope.
17C207.6	Exhibit ethical principles in engineering practices.
17C207.7	Perform task as an individual and/ or team member to manage the task in time.
17C207.8	Express the engineering activities with effective presentation and report.
17C207.9	Interpret the findings with appropriate technological/ research citation.

17C301 MA8353-TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	
17C301.1	Formulate simple Engineering problems as partial Differential Equations
17C301.2	Apply the concept of Fourier series in solving boundary value problems
17C301.3	Solve the standard partial differential equations in engineering problems like wave equations, Heat flow equations by Fourier series.
17C301.4	Solve Fourier sine and cosine transforms and properties
17C301.5	Explain the discrete transform applied to engineering problems

17C302 EE8351-DIGITAL LOGIC CIRCUITS	
17C302.1	Apply the concept of number system and digital logic families.
17C302.2	Apply the Combinational circuits with K map representation.
17C302.3	Examine the concept of Synchronous Sequential circuits.
17C302.4	Examine the concept of Asynchronous Sequential circuits and Programmability logic devices.
17C302.5	Solve VHDL program for Combinational circuits and sequential circuits.

17C303 EE8391-ELECTROMAGNETIC THEORY	
17C303.1	Apply the concept of different theorems and laws in Electromagnetic fields.

17C303.2	Interpret the concept of Electromagnetic occurrence in electric field
17C303.3	Apply the concept of different laws to execute magneto static function in different media.
17C303.4	Examine the concept of electrodynamics fields using Maxwell equations
17C303.5	Interpret the concept of electromagnetic waves and characterizing parameters.

17C304 EE8301-ELECTRICAL MACHINES - I	
17C304.1	Explain the concept of magnetic circuits in electrical machines.
17C304.2	Demonstrate the performance of transformer and its testing.
17C304.3	Describe the concept of Electro mechanical energy conversion in rotating machine.
17C304.4	Compare the mechanical and electrical performance of DC generator
17C304.5	Compare the mechanical and electrical performance of DC motors

17C305 EC8353-ELECTRONDEVICES AND CIRCUITS	
17C305.1	Explain the construction and operation of semiconductor diodes
17C305.2	Describe the structure, operation and characteristics of transistor and thyristor
17C305.3	Explain the small signal model analysis of transistor.
17C305.4	Summarize the operation of differential amplifier and multistage amplifier
17C305.5	Discuss the concepts of feedback amplifiers and various types of Oscillator

17C306 ME8792 -POWER PLANT ENGINEERING	
17C306.1	Demonstrate the construction and working of coal based thermal power plant.
17C306.2	Explain the layout, construction and working of diesel, gas and combined cycle power plant.
17C306.3	Describe the construction and working of Nuclear power plant.
17C306.4	Explain the construction and working of renewable energy sources.
17C306.5	Estimate energy calculation and environment related issues in power sectors.

17C307 EC8311-ELECTRONICS LABORATORY	
17C306.1	Analyze the PN junction diode acts as a perfect switch and Zener diode acts as voltage regulator.
17C306.2	Analyze the characteristics of a voltage-controlled device.
17C306.3	Design an experiment and determine the frequency response of common emitter amplifier
17C306.4	Design and implement a circuit that converts AC voltage to DC voltage for the given input and calculate its ripple factor and percentage of regulation with and without capacitive and inductive filter
17C306.5	Analyze the sine, square and triangular waveforms using cathode ray oscilloscope.
17C306.6	Exhibit ethical principles in engineering practices.
17C306.7	Perform task as an individual and/ or team member to manage the task in time.
17C306.8	Express the engineering activities with effective presentation and report.
17C306.9	Interpret the findings with appropriate technological/ research citation.

17C307 EE8311-ELECTRICAL MACHINES LABORATORY - I	
17C307.1	Analyze the performance characteristics of DC Shunt and Compound generator
17C307.2	Analyze the performance characteristics and speed control of various types of DC motor
17C307.3	Experimentally obtain the load characteristics of transformer.
17C307.4	Experimentally obtain the equivalent circuit of transformer.
17C307.5	Demonstrate the concept of starters for DC motors and various three phase transformer connections.
17C307.6	Exhibit ethical principles in engineering practices
17C307.7	Perform task as an individual and/ or team member to manage the task in time
17C307.8	Express the engineering activities with effective presentation and report.
17C307.9	Interpret the findings with appropriate technological/ research citation

17C401 MA8491-NUMERICAL METHODS	
17C401.1	Solve the system of linear algebraic equations in Electrical Engineering.
17C401.2	Apply the interpolation technique for solving real time engineering problems.
17C401.3	Solve single and double integrals using numerical techniques.
17C401.4	Compute the solution of first order differential equation using various finite difference method.
17C401.5	Solve ordinary and partial differential equations using numerical methods.

17C402 EE8401-ELECTRICAL MACHINES - II	
17C402.1	Examine the performance of synchronous generator.
17C402.2	Analyze the performance of synchronous motor.
17C402.3	Analyze the performance of three-phase induction motors and its characteristics.
17C402.4	Identify the different starting and speed control methods of single induction motor
17C402.5	Analyze performance of single-phase induction motor and special electrical machines.

17C403 EE8402-TRANSMISSION AND DISTRIBUTION	
17C403.1	Illustrate the structure and various transmission system in power system.
17C403.2	Explain the modelling of transmission lines
17C403.3	Demonstrate the mechanical design of overhead transmission lines
17C403.4	Explain the electrical and mechanical parameters of insulators and cables in transmission and distribution system
17C403.5	Summarize the function of components in distribution system

17C404 EE8403/ MEASUREMENTS AND INSTRUMENTATION	
17C404.1	Discuss about the characteristics and errors of measuring instruments
17C404.2	Explain the measuring instruments involved in measuring of electrical parameters
17C404.3	Classify the measuring techniques for bridges and potentiometers
17C404.4	Demonstrate the analog and digital storage and display devices
17C404.5	Demonstrate the operation of various transducers and data acquisition

17C405 EE8451-LINEAR INTEGRATED CIRCUITS AND APPLICATIONS	
17C405.1	Apply the concept of fabrication process of IC.
17C405.2	Examine e the characteristics of Operational Amplifier
17C405.3	Examine the applications of various Operational Amplifier
17C405.4	Examine the performance of special ICs
17C405.5	Examine the operations of various types of special ICs

17C406 IC8451-CONTROL SYSTEMS	
17C406.1	Explain different reduction techniques to determine the transfer function and Differentiate the working of AC and DC servomotors
17C406.2	Illustrate the time response of systems and steady state error analysis.
17C406.3	Illustrate the open loop and closed loop frequency responses of systems.
17C406.4	Demonstrate stability of the system and design of compensators.
17C406.5	Explain state variable representation of physical systems.

17C407 EE8411-ELECTRICAL MACHINES LABORATORY – II	
17C407.1	Analyze the concept of regulation of three phase alternator by various methods.
17C407.2	Analyze the performance of three phase synchronous motor by plotting "V and inverted- V" curves.
17C407.3	Experimentally obtain the load and no-load characteristics of single and three phase induction motor.
17C407.4	Analyze the losses of three phase induction motor.
17C407.5	Demonstrate the concept of starters for induction motors.
17C407.6	Exhibit ethical principles in engineering practices
17C407.7	Perform task as an individual and/ or team member to manage the task in time
17C407.8	Express the engineering activities with effective presentation and report.
17C407.9	Interpret the findings with appropriate technological/ research citation

17C408 EE8461- LINEAR AND DIGITAL INTEGRATED CIRCUITS LABORATORY	
17C408.1	Simplify and implement Boolean functions.
17C408.2	Construct and access counters using specific counter IC.
17C408.3	Analyze the applications of IC.
17C408.4	Analyze the working of timer in monostable and a stable mode.
17C408.5	Construct code converters.
17C408.6	Exhibit ethical principles in engineering practices
17C408.7	Perform task as an individual and/ or team member to manage the task in time
17C408.8	Express the engineering activities with effective presentation and report.
17C408.9	Interpret the findings with appropriate technological/ research citation

17C501 EE8501-POWER SYSTEM ANALYSIS	
CO No	Course Outcomes
17C501.1	Apply the concept of per unit representation and bus admittance network in power system.

17C501.2	Apply the different methods of power flow solution in power system
17C501.3	Analyze different symmetrical fault analysis technique in power system
17C501.4	Examine different unsymmetrical fault analysis technique in power system
17C501.5	Analyze different stability analysis techniques in power system

17C409 EE8412-TECHNICAL SEMINAR	
17C409.1	Identify the new ideas and cutting-edge technologies in various engineering domain
17C409.2	Develop team work for effective communication and healthy discussion.
17C409.3	Make effective presentation with the usage of modern tools
17C409.4	Impart skills in preparing detailed report.
17C409.5	Discuss on current scenario of social issues.
17C409.6	Exhibit ethical principles in engineering practices
17C409.7	Perform task as an individual and/ or team member to manage the task in time
17C409.8	Express the engineering activities with effective presentation and report.
17C409.9	Interpret the findings with appropriate technological/ research citation

17C502 EE8551-MICROPROCESSORS & MICROCONTROLLERS	
CO No	Course Outcomes
17C502.1	Illustrate 8085 processors and its memory organization
17C502.2	Develop 8085 ALP for various applications.
17C502.3	Illustrate 8051 controller and its memory organization
17C502.4	Illustrate the function of various peripheral interfacing ICs
17C502.5	Develop real time application using 8085 processor and 8051controller

17C503 EE8552-POWER ELECTRONICS	
CO No	Course Outcomes
17C503.1	Summarize the different types of power semiconductor devices and their switching characteristics
17C503.2	Describe the operation of Converters with and without source and load inductance.
17C503.3	Illustrate the operation and switching characteristics of Choppers and outline the applications.
17C503.4	Discuss the different modulation and harmonic reduction techniques of Inverters.
17C503.5	Describe the operation of AC voltage controller and cyclo converter.

17C 504 EE8591-DIGITAL SIGNAL PROCESSING	
17C504.1	Classify the different types of discrete time signals and systems
17C504.2	Apply the Z transform and Inverse Z transform to the discrete time systems.
17C504.3	Apply Radix-2 Decimation in Time (DIT) and Decimation in Frequency (DIF)FFT Algorithm to Compute Discrete Fourier Transform.

17C504.4	Construct the IIR and FIR Digital filters.
17C504.5	Explain the architectures and functions of Digital signal processors.

17C505 CS8392- OBJECT ORIENTED PROGRAMMING	
CO No	Course Outcomes
17C505.1	Demonstrate object oriented programs using polymorphism and data abstraction concepts.
17C505.2	Apply templates, construct generics and to handle exceptions
17C505.3	Apply the concept of java in creating classes, objects using arrays and control statements.
17C505.4	Describe packages, handle exceptions and multi-threaded programs.

17C506 (OE-I) OMD551-BASICS OF BIOMEDICAL INSTRUMENTATION	
CO No	Course Outcomes
17C506 .1	Discuss the origin of bio potential and types of electrodes.
17C506 .2	Compare the characteristics of bio signals and electrode configuration
17C506 .3	Describe the performance of signal conditioning unit.
17C506 .4	Demonstrate the measurement of non-electrical parameters.
17C506 .5	Explain the different bio-chemical measurement.

17C506 (OE-I) OCE551-AIR POLLUTION CONTROL AND ENGINEERING	
CO No	Course Outcomes
17C506 .1	Describe the major sources of air pollution and their effects.
17C506 .2	Explain the atmospheric diffusion theories
17C506 .3	Explain the various methods to control particulate contaminants.
17C506 .4	Explain the various methods to control gaseous contaminants.
17C506 .5	Outline the sources and effects of noise pollution.

17C507 EE8511-CONTROL AND INSTRUMENTATION LABORATORY	
CO No	Course Outcomes
17C507.1	Illustrate stability analysis of system using controllers.
17C507.2	Demonstrate the Lag, Lead and Lag-Lead Compensators.
17C507.3	Explain the position control and Characteristics of synchro's.
17C507.4	Calculate the unknown parameters of bridge networks and dynamics of sensor, transducer.
17C507.5	Calculate the measurement of power, Energy and the concept of signal conditioning.
17C507.6	Exhibit ethical principles in engineering practices.
17C507.7	Perform task as an individual and/ or team member to manage the task in time
17C507.8	Express the engineering activities with effective presentation and report.
17C507.9	Interpret the findings with appropriate technological/ research citation

17C508 HS8581-PROFESSIONAL COMMUNICATION	
CO No	Course Outcomes
17C508.1	Summarize various skill such as soft skill, hard skill, employability and career skill and demonstrate values such as time management and general awareness of current affairs
17C508.2	Demonstrate oneself before the audience by making effective presentations on introducing oneself, answering questions and visual presenting.
17C508.3	Demonstrate oneself by participating in group discussion, brainstorming sessions and question sessions
17C508.4	Develop interview skills so as to be successful in them
17C508.5	Develop adequate soft skill required for the workplace and long-term career
17C508.6	Exhibit ethical principles in engineering practices
17C508.7	Perform task as an individual and/ or team member to manage the task in time
17C508.8	Express the engineering activities with effective presentation and report.
17C508.9	Interpret the findings with appropriate technological/ research citation

17C509 CS8383 – OBJECT ORIENTED PROGRAMMING LABORATORY	
CO No	Course Outcomes
17C509.1	Design C++ programs using functions, classes with objects, member functions and constructors.
CO2	Develop operator and function over loading and run time polymorphism using C++.
CO3	Develop file handing techniques in C++ for sequential and random access also use Java code for strings.
CO4	Construct packages and interfaces in Java.
CO5	Create threads in Java and handle predefined and user defined exception.
LCO1	Exhibit ethical principles in engineering practices.
LCO2	Perform task as an individual and/ or team member to manage the task in time.
LCO3	Express the engineering activities with effective presentation and report.
LCO4	Interpret the findings with appropriate technological/ research citation.

17C601 EE8601-SOLID STATE DRIVES	
CO No	Course Outcomes
17C601.1	Interpret the concept of steady state operation and transient dynamics of a motor load system.
17C601.2	Examine the operation of converter and Chopper fed DC drives.
17C601.3	Examine the different control methods of Induction motor drives
17C601.4	Examine the different control methods of Synchronous motor drives
17C601.5	Apply the different controllers for DC motor drives.

17C602 EE8602-PROTECTION AND SWITCHGEAR

CO No	Course Outcomes
17C602.1	Summarize the protection scheme under abnormal condition in power system.
17C602.2	Demonstrate the various types electromagnetic Relaysin power system.
17C602.3	Compare the different protective schemes employed in power system.
17C602.4	Explain the operation of static and numerical relays in power system.
17C602.5	Classify the function and different testing of circuit breakers inpower system.

17C603 EE8691-EMBEDDED SYSTEMS

CO No	Course Outcomes
17C603.1	Summarize the basic build process of embedded systems and structural units.
17C603.2	Classify the types of I/O device ports, buses and different interfaces for data transfer.
17C603.3	Discuss the Embedded Product Development Life Cycle (EDLC).
17C603.4	Discuss the basic concept of Real Time Operating Systems.
17C603.5	Describe the programming concepts of Embedded Systems.

17C604 (PE-I) EE8002 - DESIGN OF ELECTRICAL APPARATUS

CO No	Course Outcomes
17C604.1	Explain the design considerations for rotating and static electrical machines.
17C604.2	Select the main dimensions and cooling systems for transformers.
17C604.3	Identify armature and field dimensions of DC machines
17C604.4	Select the stator and rotor dimensions of induction machines.
17C604.5	Select the stator and rotor dimensions of synchronous machines.

17C605 (PE-II) EE8005- SPECIAL ELECTRICAL MACHINES

CO No	Course Outcomes
17C605.1	Demonstrate the performance characteristics of different types of stepper motor
17C605.2	Describe the characteristics and control function of switched reluctance motor.
17C605.3	Explain the characteristics and control function of permanent magnet brushless D.C. motors.
17C605.4	Describe the characteristics and control function for permanent magnet synchronous motor
17C605.5	Explain the performance of other special machines.

17C606 EE8661-POWER ELECTRONICS AND DRIVES LABORATORY

CO No	Course Outcomes
17C606.1	Describe performance characteristics of Power semiconductor devices
17C606.2	Discuss the performance of single-phase bridge Rectifier.
17C606.3	Describe the performance of step up & step-down chopper
17C606.4	Discuss the performance of PWM based single phase & Three phase inverter

17C606.5	Describe the performance of AC voltage controller
17C606.6	Exhibit ethical principles in engineering practices
17C606.7	Perform task as an individual and/ or team member to manage the task in time
17C606.8	Express the engineering activities with effective presentation and report.
17C606.9	Interpret the findings with appropriate technological/ research citation

7C607 EE8681-MICROPROCESSORS AND MICROCONTROLLERS LABORATORY

CO No	Course Outcomes
17C607.1	Apply the arithmetic operations, logical operations and sorting using 8085 microprocessors.
17C607.2	Develop program using control instructions.
17C607.3	Analyze the operation of peripheral interfacing with 8085 microprocessors.
17C607.4	Apply the arithmetic operations, logical operations and branching operation using 8051 microcontrollers.
17C607.5	Develop a program for peripheral interfacing with 8051 microcontrollers.
17C607.6	Exhibit ethical principles in engineering practices
17C607.7	Perform task as an individual and/ or team member to manage the task in time
17C607.8	Express the engineering activities with effective presentation and report.
17C607.9	Interpret the findings with appropriate technological/ research citation

17C608 EE8611-MINI PROJECT

CO No	Course Outcomes
17C608.1	Use literature to identify the objective, scope and concept of the work.
17C608.2	Apply suitable methods and materials to carry out experiments by conserving ecosystem.
17C608.3	Develop a prototype/experimental set-up necessary to complete the project.
17C608.4	Discuss the results obtained to derive conclusions.
17C608.5	Defend the work by preparing a report as per the University format
17C608.6	Exhibit ethical principles in engineering practices
17C608.7	Perform task as an individual and/ or team member to manage the task in time
17C608.8	Express the engineering activities with effective presentation and report.
17C608.9	Interpret the findings with appropriate technological/ research citation

17C701 EE8701-HIGH VOLTAGE ENGINEERING

CO No	Course Outcomes
17C701.1	Describe the various causes for transients in power system.
17CO2.2	Compare the various breakdown mechanisms in insulations.
17CO3.3	Explain the generation of high voltage and high current.
17CO4.4	Summarize the various high voltage and high current measuring methods.
17CO5.5	Select the various power apparatus testing and insulation coordination in power system.

17C702 EE8702-POWER SYSTEM OPERATION AND CONTROL

CONo	Course Outcomes
17C702.1	Demonstrate the overview of power system operation and control.
17C702.2	Examine the performance of load-frequency control.
17C702.3	Analyse the performance of reactive power controller.
17C702.4	Apply an economic operation of power system.
17C702.5	Analyse various state of power system

17C703 EE8703-RENEWABLE ENERGY SYSTEMS

CONo	Course Outcomes
17C703.1	Explain the renewable energy sources and types.
17C703.2	Explain the working of Wind power plant.
17C703.3	Describe the performance of solar PV and thermal system.
17C703.4	Discuss about Biomass energy.
17C703.5	Explain the working principle of Tidal energy and fuel cell.

17C704 (OE-II) OBT751-ANALYTICAL METHODS AND INSTRUMENTATION

CO No	Course Outcomes
17C704.1	Discuss the fundamentals of Spectrometry system.
17C704.2	Demonstrate the measurement of Transmittance & Absorbance in molecular spectrometry.
17C704.3	Identify the parameters of mass spectrometry.
17C704.4	Differentiate the different optimization techniques in chromatography.
17C704.5	Discuss the concept of different application of electro analysis.

17C704 (OE-II) OML751-TESTING OF MATERIALS

CO No	Course Outcomes
17C704.1	Explain the classification and purpose of material testing
17C704.2	Interpret the mechanical testing: Principles, Techniques, Methods, Advantages and Limitation, Applications
17C704.3	Interpret the Non-Distractive testing: Principles, Techniques, Methods, Advantages and Limitations, Applications
17C704.4	Explain various material characterization techniques amd its principles, types, advantages and limitations, applications
17C704.5	Interpret Thermal and chemical testing principles, advantages and applications.

17C705 (PE-III) EI8075-FIBRE OPTICS AND LASER INSTRUMENTATION

CONo	Course Outcomes
17C705.1	Explain the basic concepts of optical fibers and their properties.
17C705 .2	Describe the knowledge about the Industrial applications of optical fibers.
17C705 .3	Illustrate the Laser fundamentals.
17C705 .4	Describe the knowledge about Industrial application of lasers.
17C705 .5	Illustrate the knowledge about holography and Medical applications of Lasers.

17C706 (PE-IV) EE8009-CONTROL OF ELECTRICAL DRIVES

CO No	Course Outcomes
17C706.1	Explain the various control strategies of DC motor drives
17C706.2	Explain the various control strategies of Induction motor drives
17C706.3	Explain the various control strategies of Synchronous motor drives
17C706.4	Describe the design factor of SRM drive and the operation of BLDC machine.
17C706.5	Describe the digital control strategy of DC drives.

17C707 EE8711-POWER SYSTEM SIMULATION LABORATORY

CO No	Course Outcomes
17C707.1	Construct the parameter of transmission line and bus impedance and admittance matrices in power system.
17C707.2	Demonstrate load flow analysis using Gauss seidel and Newton Raphson method.
17C707.3	Analyze the various faults in power system.
17C707.4	Demonstrate the transient stability analysis of single machine and Multi machine Power Systems
17C707.5	Analyze the load frequency of single and two area power system and economic dispatch in a power system.
17C707.6	Exhibit ethical principles in engineering practices
17C707.7	Perform task as an individual and/ or team member to manage the task in time
17C707.8	Express the engineering activities with effective presentation and report.
17C707 .9	Interpret the findings with appropriate technological/ research citation

17C708 EE8712-RENEWABLE ENERGY SYSTEMS LABORATORY

CO No	Course Outcomes
17C708.1	Analyze the Renewable Energy Systems.
17C708.2	Analyze the characteristics of Solar PV System
17C708.3	Design an experiment on Shadowing effect and diode-based solution for Solar PV System
17C708.4	Explain the basics of Intelligent Controllers for Hybrid Systems
17C708.5	Analyze the current and possible future role of Renewable Energy Sources.
17C708.6	Exhibit ethical principles in engineering practices
17C708.7	Perform task as an individual and/ or team member to manage the task in time
17C708.8	Express the engineering activities with effective presentation and report.
17C708.9	Interpret the findings with appropriate technological/ research citation

17C801 (PE-V) EE8015-ELECTRIC ENERGY GENERATION, UTILIZATION AND CONSERVATION	
CO No	Course Outcomes
17C801.1	Describe the energy saving concepts in different types of illumination
17C801.2	Explain different types of refrigeration and air conditioning systems.
17C801.3	Apply the different methods of electric heating and electric welding
17C801.4	Summarize the various electric traction systems
17C801.5	Apply domestic wiring connection and earthing connection.

17C802 (PE-VI) EE8017-HIGH VOLTAGE DIRECT CURRENT TRANSMISSION	
CO No	Course Outcomes
17C802.1	Explain the principles and types of HVDC system.
17C802.2	Summarize the concepts of HVDC converters.
17C803.3	Explain the control of converter and HVDC system.
17C803.4	Explain the concepts of reactive power and harmonics control.
17C803.5	Illustrate the concept of power flow analysis in AC/DC systems.

17C804 EE8811-PROJECT WORK	
17C804.1	Use literature to identify the objective, scope and concept of the work.
17C804.2	Apply suitable Apply suitable methods and materials to carry out experiments by conserving ecosystem
17C804.2	Develop a prototype/experimental set-up necessary to complete the project
17C804.2	Discuss the results obtained to derive conclusions
17C804.2	Defend the work by preparing a report as per the University format
17C804.2	Exhibit ethical principles in engineering practices
17C804.2	Perform task as an individual and/ or team member to manage the task in time
17C804.2	Express the engineering activities with effective presentation and report.
17C804.2	Interpret the findings with appropriate technological/ research citation

HOD   **PRINCIPAL**