



RAAK

COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)

An ISO 9001:2015 Certified Institution

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SUBJECT LIST

(14-15 Regulations)

Code No.	Name of the Subjects
SEMESTER I	
Theory	
T101	Mathematics – I
T102	Physics
T103	Chemistry
T110	Basic Civil and Mechanical
T111	Engineering Mechanics
T112	Communicative English
Practical	
P104	Physics lab
P105	Chemistry lab
P106	Workshop Practice
SEMESTER II	
Theory	
T107	Mathematics – II
T108	Material Science
T109	Environmental Science
T104	Basic Electrical and Electronics Engineering
T105	Engineering Thermodynamics
T106	Computer Programming
Practical	
P101	Computer Programming Laboratory
P102	Engineering Graphics
P103	Basic Electrical & Electronics Laboratory
P107	NSS / NCC
SEMESTER III	
Theory	
MA T31	Mathematics – III



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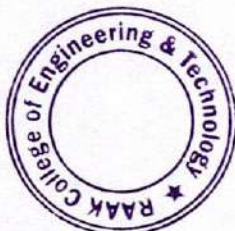
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EE T32	Electric Circuit Analysis
EE T33	Electrical Machines – I
EE T34	Electronic Devices and Circuits
EE T35	Electromagnetic Theory
EE T36	Fluid and Thermal Machines
	Practical
EE P31	Electrical Machines Lab-I
EE P32	Electronics Lab –I
EE P33	Fluid and Thermal Machines Lab
SEMESTER IV	
	Theory
MA T41	Mathematics – IV
EE T42	Electrical Machines – II
EE T43	Electronic Circuits
EE T44	Linear Control Systems
EE T45	Pulse and Digital Circuits
EE T46	Data structures and Object Oriented Programming
	Practical
EE P41	Electrical Machine Lab – II
EE P42	Electronics Lab – II
EE P43	Data Structures and Object Oriented Programming Lab
SP P44	Physical Education
SEMESTER V	
	Theory
EE T51	Communication Engineering
EE T52	Analog and Digital Integrated Circuits
EE T53	Transmission and Distribution
EE T54	Power Electronics
EE T55	Measurements and Instrumentation
EE E04	Energy Engineering
	Practical
EE P51	Electronics Lab – III
EE P52	Measurements and Control Lab
HS P53	General Proficiency – I



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SEMESTER VI	
	Theory
EE T61	Power System Analysis
EE T62	Utilization of Electrical Energy
EE T63	Microprocessors and Microcontrollers
EE T64	Electrical Machine Design
EE T65	Digital Signal Processing
EE E06	Special Electrical Machines
	Practical
EE P61	Power Electronics Lab
EE P62	Micro Processor and Microcontroller Lab
HS P63	General Proficiency – II
SEMESTER VII	
	Theory
EE T71	Industrial Management
EE T72	Solid State Drives
EE T73	Power system operation and control
EE E16	Power System Restructuring And Deregulation
EE E12	Renewable Energy Sources
	Practical
EE P71	Power System Simulation Lab
EE PW7	Project Phase – I
EE P72	Seminar
EE P73	Training/Industrial Visit
SEMESTER VIII	
	Theory
EE T81	Protection and Switchgear
EE T82	Professional Ethical Practice
EE E19	Smart Grid
EE E15	HVDC Transmission
	Practical
EE PW8	Project Phase –II
EE P81	Comprehensive Viva




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SEMESTER I

T101 Mathematics – I	
CO 1	Apply knowledge of mathematics to solve functions of several variables.
CO 2	Identify, formulate and solve engineering problems like multiple integrals and their usage.
CO 3	To solve differential equations that model physical process using effective mathematical tools.
CO 4	Able to find equation of straight line of shortest distance, equation of plane, angle between straight lines.
CO 5	Gain the knowledge to solve first order differential equation arising in engineering.

T102 Physics	
CO 1	Apply knowledge of science and engineering to understand physics and its significant contribution in the advancement of Technology and invention of new products that dramatically transform modern day society.
CO 2	Identify different areas of physics which have direct relevance and applications to different engineering disciplines.
CO 3	Apply fundamental knowledge to understand application of ultrasonics, optics and some optical devices, lasers and fiber optics, nuclear energy sources and wave mechanics.
CO 4	Understand the basic operating principles of laser its applications optical fiber and its types transmission characteristics applications of optical fibers.
CO 5	Understand the basic operating principles of laser its applications optical fiber and its types transmission characteristics applications of optical fibers.

T103 Chemistry	
CO 1	Apply knowledge of Science and Engineering to understand the importance of chemistry in engineering domain.
CO 2	Identify different electrochemical cells and their usage for industrial process.
CO 3	Apply fundamental knowledge of chemistry and build an interface of theoretical concepts with industrial applications / Engineering applications.
CO 4	Guide the students to gain the knowledge about the cooling curves, phase diagrams, alloys and their practical importance.
CO 5	Strengthen the fundamentals of chemistry and then built an interface of theoretical concepts with their industrial engineering /applications.



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T110 Basic Civil and Mechanical	
CO 1	Understand the building classification as per National Building code.
CO 2	Get the idea about construction procedure for various components of the building.
CO 3	Students understand the principles of Surveying, construction procedure for roads, bridges and dams.
CO 4	Student will be able to know about the working of internal and external combustion systems.
CO 5	Student will be able to know about Non-conventional energy systems.
CO 6	Student will be able to know about manufacturing process.

T111 Engineering Mechanics	
CO 1	Understand the basic laws of mechanics and resolution of forces using different methods.
CO 2	Learn and apply the knowledge on analysis of forces acting on the process and effect of friction force on bodies.
CO 3	Learn about the centroid and moment of inertia for plane and solid figures.
CO 4	Understand the three laws of motion principles of dynamics for particles.
CO 5	The student will be able to analyse the laws of motion for the rigid bodies.

T112 Communicative English	
CO 1	Learn about the definition of communication, importance, concept, sender, ideation, the levels in communication, channels, oral and written way of communication, body language and nonverbal communication, accuracy, Brevity and clarity, different barriers for communication, techniques in making effective communication, listening important and type of listening.
CO 2	Students learn about the types of letters, report writing, notices and memo and also develop skill in writing.
CO 3	Understand the comprehension, identify the difference between skimming and scanning, guess the meaning of the words, identify to make notes.
CO 4	Students learnt the writing skills, how to write a paragraph in a proper manner, four modes of writing and how to make bibliographical entries.
CO 5	Students are able to develop their spoken skills by making them to involve in many activities related to it.




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P104 Physics lab	
CO 1	Able to understand how to find the thickness of the specimen and also to find the radius of curvature of glass using the phenomena of interference of light.
CO 2	Able to understand the specific rotatory power of an optical active solution using the principle of polarization.
CO 3	To understand about thermal conductivity of bad conductor and rubber tube.
CO 4	Ability to understand about the optical properties like dispersive power, resolving power by applying the knowledge of optics.

P105 Chemistry lab	
CO 1	Student will become will acquainted to test amount of hardness present in sample of water for the year engineering needs.
CO 2	Students will be efficient in estimating acidity/alkalinity in given examples.
CO 3	Students will have knowledge about estimating amount of dissolved oxygen in water.
CO 4	Students will become well acquainted to estimate copper in brass.
CO 5	Students will have knowledge about determination of viscosity of sucrose using Ostwald's viscometer.
CO 6	To develop an understanding of basic titration setup and methodologies for determining strength, hardness and alkalinity of various unknown solutions.

P106 Workshop Practice	
CO 1	Understand and comply with workshop safety regulations
CO 2	Student will be able to make various joints in the given object with the available work material.
CO 3	Student will be able to know how much a joint will take for the assessment of time.
CO 4	Student can be able to identify the hand tools and instruments.
CO 5	Student can be able to gain knowledge about various operations carried out in sheet metal.
CO 6	Student can be able to gain skills about various tools used in welding to make simple joints.



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SEMESTER II

T107 Mathematics – II	
CO 1	Apply knowledge of mathematics to solve Matrix algebra technique for practical applications and curl divergence and integration of vectors in vector calculus.
CO 2	Identify formulate and solve engineering problems like Laplace transform and to solve differential and integral equations.
CO 3	Apply formally and analyse problems of 4 year transform techniques.
CO 4	Determine the Fourier transform, Fourier cosine & sine transform of elementary functions, properties of transforms and its applications in engineering.
CO 5	Acquire knowledge of matrix algebra technique, vector calculus, Laplace and Fourier transform.

T108 Material Science	
CO 1	Apply core concepts in material science to solve engineering problems.
CO 2	Knowledgeable of contemporary issues relevant to material science and engineering
CO 3	Understand about the ferrites and its application to magnetic materials.
CO 4	Select materials for design and construction.
CO 5	Understand the importance and properties of materials

T109-Environmental Science	
CO 1	Apply fundamental knowledge to understand about the environment.
CO 2	Identify environmental pollution through science.
CO 3	Apply basic knowledge to solve various environmental issues and problems.
CO 4	Ability to consider issues of environment and sustainable development in his personal and professional undertakings.
CO 5	Provides a comprehensive knowledge in environmental science, environmental issues and the management from an interdisciplinary perspective.




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T104-Basic Electrical and Electronics Engineering	
CO 1	Will learn the fundamentals of rotational and stationary machine operation, single- phase and three-phase power measurement, magnetic and electrical circuits, and thesetopics.
CO 2	Will learn the fundamentals of measuring devices, communication systems, andnetwork models.
CO 3	Knowledge about non-conventional energy systems will be available to students.
CO 4	The varieties of metal joining will be known by the students.
CO 5	Students will learn about numerous engines, energies, and joints as well as construction and building components offered with diverse principles.

T105-Engineering Thermodynamics	
CO 1	Apply knowledge of mathematics, science and engineering to understand the basics of thermodynamics.
CO 2	Understand the importance of laws of thermodynamics applied to energy systems.
CO 3	Understanding refrigeration, heat pump and their physical mechanism.
CO 4	Understand the laws of motion for rigid bodies.
CO 5	Understand the effects of forces acting on the bodies in practical situation.

T106-Computer Programming	
CO 1	Know concepts in problem solving.
CO 2	To do programming in C language.
CO 3	To write diversified solutions using the C language.
CO 4	To know about structures, pointers and its manipulation.
CO 5	To know about the evaluation of computers, components and its applications. Basic knowledge on the internet, information technology, word processing and worksheets.

P101-Computer Programming Laboratory	
CO 1	Students can work with command line interface OS's, like MS-DOS.
CO 2	Students can solve most of the real time problems with C program.
CO 3	Students can interact with computer using C program, through various input and output functions.
CO 4	Students can make a use of various keywords, constants, variables, data



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	types, operators, type conversion in C program.
CO 5	Students will have knowledge about arrays, functions, structures and pointers in C program.

P102-Engineering Graphics	
CO 1	Perform freehand sketching of basic geometrical constructions and multiple views of objects.
CO 2	Project orthographic projections of lines and plane surfaces.
CO 3	Draw projections and solids and development of surfaces.
CO 4	Visualize and to project isometric and perspective sections of simple solids.
CO 5	Students will be able to draw orthographic projections and isometric projections.

P103-Basic Electrical and Electronics Laboratory	
CO 1	Know about basic electrical tools, applications and precautions
CO 2	Perform different types of wiring used in domestic and industrial applications.
CO 3	Measurements of voltage and phase using CRO, basic operation and applications of devices such as PN junction diode and transistors.
CO 4	Understand the function and applications of basic logic gates and flip flops.
CO 5	Gain knowledge in domestic wiring and application of electronics device in the field of electrical engineering.

P107-NSS/NCC	
CO 1	To create awareness in social and environmental issues.
CO 2	To participate in relief and rehabilitation work during natural calamities.
CO 3	To develop some proposals for local slum area development and waste disposal.
CO 4	To create team works among students and produce efficient results.
CO 5	To operate scientific instruments or advanced software.

SEMESTER III

MA T31-Mathematics – III	
CO 1	Familiarize with the concept of analytic function, C-R equations and its uses.
CO 2	Learn about Cauchy's theorem and its uses in complex integration. Taylor's and Laurent's series in complex form.



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CO 3	Learn about Cauchy Residues theorem and contour integrations.
CO 4	Gain knowledge of Finite and Infinite Fourier Transforms and applications.
CO 5	To introduce the Root mean square value and Parseval theorem on Fourier for practical applications.

EE T32 Electric Circuit Analysis	
CO 1	Illustrate various DC electrical networks by using principles of network theorems.
CO 2	Illustrate various AC electrical networks by using principles of network theorems.
CO 3	To analyse the three phase circuits with Star & Delta connected balanced and unbalanced loads and two port networks.
CO 4	Analyse transient response of RL, RC and RLC circuits for DC & AC network
CO 5	To analyse the frequency response characteristics of resonance circuits and its associated parameters and to explain the operation of single tuned circuit

EE T33 Electrical Machines – I	
CO 1	To emphasize the basic concepts of electromechanical energy conservation through energy and co-energy.
CO 2	To know about the elementary concepts of rotating machines (DC generator)
CO 3	To gain knowledge in the performance characteristics of DC motor.
CO 4	To understand the principles, the equivalent circuit, various characteristics and efficiency of transformers.
CO 5	To gain knowledge in polyphase transformer, special transformer and testing of various types of transformers.

EE T34 Electronic Devices and Circuits	
CO 1	To understand about the characteristics of semiconductor diodes and its Applications.
CO 2	To understand about the semiconductors in the functioning of BJT.
CO 3	To demonstrate the switching and amplification application for Field Effect Transistor..
CO 4	To know about the basic types of power diode and its working principles.
CO 5	To gain knowledge in types of diodes & about Opto electronic devices.




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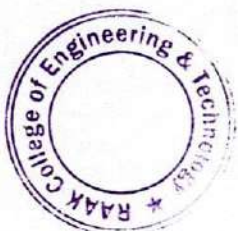
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EE T35 Electromagnetic Theory	
CO 1	To apply the various laws of Electrostatics
CO 2	To know about the basic laws of current electricity & about the process of dielectric medium & its strength.
CO 3	To know about the various laws in magnetic effects of electric current
CO 4	To analyse the magnetic forces, Self and Mutual inductances and energy stored in the magnetic field using laws of magneto-statics.
CO 5	To analyse Maxwell's equation in different forms (differential and integral) and apply them to diverse engineering problems. To Examine the phenomena of wave propagation in free space and different media and its interfaces.

EE T36 Fluid and Thermal Machines	
CO 1	Students will be able to apply Euler's, Bernoulli's equations and the conservation of mass to determine velocities, resources and accelerations for incompressible and in viscid fluids.
CO 2	Provide information about the different types of pump and hydraulic turbine and its efficiency.
CO 3	Providing knowledge about the working of steam turbine, efficiency and its working cycle.
CO 4	Students can understand the concepts of engine and air conditioning system.
CO 5	Providing knowledge about the various gas cycles and its efficiency and can able to know the working principles of air compressor and its selection process.

EE P31 Electrical Machines Lab-I	
CO 1	Knowledge on performance of DC Shunt and Series Motor and on speed control behaviour of DC Shunt Motor.
CO 2	Knowledge on the Characteristics of DC Shunt generator on O.C and Load conditions.
CO 3	Knowledge on the performance of Single Phase Transformer.
CO 4	Knowledge on performance of Synchronous machine.
CO 5	Knowledge on performance and speed control behaviour of an induction motor.



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EE P32-ELECTRONICS LAB-I	
CO 1	Proficient in using basic electronic measurement instruments such as multimeters, oscilloscopes, and function generators. They should be able to measure voltage, current, frequency, and other relevant parameters accurately.
CO 2	Analyze the V-I characteristics of diodes, transistors.
CO 3	Analyze the V-I characteristics of SCR, TRIAC and UJT.
CO 4	Implement the application of diode by constructing the rectifiers with and without filters.
CO 5	Design self-bias and fixed bias circuits using transistor.

EE P33-Fluid and Thermal Machines Lab	
CO 1	Understand turbo machines, positive displacement pumps, and application of impulse momentum equation and velocity triangles.
CO 2	Analyse hydraulic turbines, including Pelton Wheel, Francis, Kaplan, with velocity triangles and performance characteristics.
CO 3	Understand hydraulic pumps, centrifugal pumps, and reciprocating pumps, considering power estimation, efficiency, and governing mechanisms.
CO 4	Explore air machines, compressors, fans, including reciprocating, centrifugal, axial flow compressors, blowers, and fans.
CO 5	Study special purpose pumps, machines, and hydraulic devices, considering gear pump, vane pump, screw pump, vacuum pump, and applications.

SEMESTER IV

MA T41-Mathematics-IV	
CO 1	Formulate and solve partial differential equation.
CO 2	Derive and obtain the solution of wave equation and boundary value problems.
CO 3	Derive and obtain the solution of heat equation and boundary value problems.
CO 4	Apply least square method to fit various curves for the given data investigate the validity of hypothesis by Z-distribution techniques.
CO 5	Calculation of analysis of variance and explain the use of the Chi-squared test and its calculation.



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EE T42-Electrical Machines-II	
CO 1	Evaluate and analyse the performance of three phase induction motor using equivalent circuits and circle diagram.
CO 2	Apply suitable starting and speed control methods to enhance the performance of three phase induction motors.
CO 3	Analyse the performance characteristics of alternator and compute voltage regulation with different methods.
CO 4	Analyse the characteristics of synchronous motor and its performance with effect of varying load and excitation.
CO 5	To characteristics of single phase induction motors and special machines as well as choose an appropriate motor for any industrial application.

EE T43-ELECTRONIC CIRCUITS	
CO 1	Design the transistor Amplifiers using its small signal model
CO 2	Design cascade amplifiers and sweep circuits
CO 3	Evaluate the performance analysis of large signal amplifier.
CO 4	Design the feedback amplifiers and analyze frequency response.
CO 5	Design oscillators for different types of signal generation.

EE T44-LINEAR CONTROL SYSTEMS	
CO 1	Express a transnational and Rotational mechanical system into its equivalent Electrical system using free body diagrams and Force-voltage, force-current, Torque-voltage and Torque Current analogies. Solve for the transfer function for a given block diagram using block diagram reduction techniques and Mason' Gain formula.
CO 2	Determine the output response and time domain specifications of first and second order closed loop system through Laplace transform method and Apply the Positional, Integral and derivative controllers for reducing the steady state errors and transient response of first and second order control systems.
CO 3	Synthesize the frequency response from the transfer function using Bode plot and Polar plot and analyses the stability of the given systems.
CO 4	Diagnose the stability of a given system from its transfer function with the help of Routh- Hurwitz criteria and Root locus Techniques.
CO 5	To analyse model and design controllers for linear dynamic systems.



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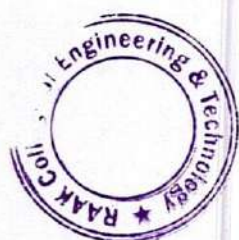
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EE T45-PULSE AND DIGITAL CIRCUITS	
CO 1	To have knowledge in various linear wave shaping circuits, pulse transformer and switching circuits.
CO 2	To describe the various operation in multi vibrator and time base circuit.
CO 3	Design of combinational circuits, encoders & decoders and simplification of Boolean expression using K-map.
CO 4	Design of counters such as up/down counters and knowledge about various types of memory.
CO 5	Design of synchronous sequential circuits with the help of model selection, state transition diagram, state synthesis table and state reduction technique. Analysis of asynchronous circuit with example problems.

EE T46-DATA STRUCTURES AND OBJECT ORIENTED PROGRAMMING	
CO 1	Discuss about programming principles and analyzing the problems and about types of arrays.
CO 2	To gain knowledge about linear data structure, representation of stack, operation of stack and its application.
CO 3	To describe about the non linear data structures.
CO 4	To discuss about the structures oriented objected programming with C++.
CO 5	To solve various computing problems using C++ languages.

EE P41-ELECTRICAL MACHINES LAB-II	
CO 1	Test the performance of induction and synchronous machines by conducting suitable experiments and report the results.
CO 2	Predetermine the different performance characteristics of single phase and three phase induction motors.
CO 3	Analyze the speed control techniques and electrical braking of induction motor.
CO 4	Experiment the synchronization of alternators and analyze the power exchange with the grid.
CO 5	Develop any prototype modules implementing different control techniques in Induction and Synchronous machines for various applications.

EE P42-ELECTRONICS LAB-II	
CO 1	With the help of design principles practice different types of amplifiers, high frequency oscillators and multi vibrators.
CO 2	To practice with the various combinational circuits using logic gates,



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	counters using IC's.
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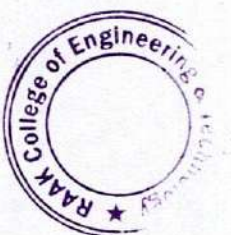
EE T46-DATA STRUCTURES AND OBJECT ORIENTED PROGRAMMING	
CO 1	To implement the linear and non linear data structure concept in C languages.
CO 2	To implement and understand the object oriented programming concept in C++.

EE P41 – Electrical Machines Lab - II	
CO 1	Analyze the performance of different induction motors under no load and load conditions.
CO 2	Demonstrate the predetermination methods of finding the losses and efficiency of synchronous machines.

EE P42 – Electronics Lab - II	
CO 1	With the help of design principles practice different configuration of amplifiers and demonstrate low and high frequency oscillators and multivibrators.
CO 2	Discuss the combinational circuit as Adder, subtractor, and magnitude comparator, multiplexers, encoders, decoders and demultiplexer using logic gates, counters using ICs.

EE P43 – Object Oriented Programming Lab	
CO 1	Implement the linear and non linear data structure concept in C language.
CO 2	Implement and understand the object oriented programming concept in C++.

SP P44-Physical Education	
CO 1	Understanding the opportunities of students' physical, cognitive, social and emotional development.
CO 2	Understanding of individual and group motivation and behaviour.
CO 3	To create teamwork among students and produce efficient results.
CO 4	The students were taught to operate advanced playing kits.
CO 5	To motivate the students to prepare the professional and scientific reports.



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SEMESTER V

EE T51 – COMMUNICATION ENGINEERING	
CO1	To understand the concept of analog and digital modulation techniques
CO2	To understand the concept of ASK, PSK & FSK
CO3	To get a depth knowledge in spectrum system
CO4	Ability to understand the wireless system and protocol
CO5	To understand the design communication in smart Grid Technology

EE T52 – ANALOG AND DIGITAL INTEGRATED CIRCUITS	
CO1	Describe the IC fabrication process for any circuits.
CO2	Design and analyze OP AMP based circuits for different applications like A/D and D/A conversion
CO3	Design filters and waveform generation using OP AMP
CO4	Design regulation for Power supply circuits
CO5	Design multi-vibrators using 555 timer and demodulators using 565 PLL

EE T53 Transmission and Distribution	
CO 1	Summarize the structure of generation, transmission and distribution with real time connection schemes.
CO 2	Calculate the line parameters in the transmission system and their effects in the overhead lines.
CO 3	Analyze on different types of transmission lines (short, medium, long) and its performance.
CO 4	Choose the adaptable types of insulators and cables for transmission and distribution system.
CO 5	Compare various schemes of electrification and gain knowledge on high voltage AC/ DC systems.

EE T54 Power Electronics	
CO1	To explain the different types of power semiconductor devices and their Characteristics
CO2	To distinguish between 1 phase and 3 phase controlled converters
CO3	Analyze the operation of AC voltage controllers and different types of DC-DC converters
CO4	Analyze the operation of cycloconverter
CO5	Illustrate the operation of Inverters and application of power electronics




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EE T55-MEASUREMENTS AND INSTRUMENTATION	
CO1	To understand the knowledge about the basic Generalized measurement system, Methods of measurement & Types of error
CO2	To understand the effects of electromechanical instruments
CO3	Develop the suitable bridge for the measurement of electrical parameter
CO4	To understand the concept of display & recording devices.
CO5	To Understand the concept of transducer & its applications.

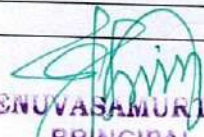
EE E04-ENERGY ENGINEERING	
CO1	Analyse the national and international energy scenario of renewable energy Sources
CO2	To gain adequate knowledge on Conventional Energy Sources
CO3	To outline about the Hydro and Ocean Energy Electric Technologies
CO4	To provide knowledge on Wind, Solar Energy and DG Technologies.
CO5	To provide knowledge on Energy Conservation And Management

EE P51-ELECTRONICS LAB-III	
CO1	To demonstrate all types of analog electronic circuits like voltage regulators, amplifiers, oscillators, filters and multivibrators.
CO2	To develop the circuits like encoder, decoder, multiplexer and digital to analog converters.

EE P52-MEASUREMENT AND CONTROL LAB	
CO1	Realize the advantages and the necessity of measurement systems in all Engineering and Scientific works.
CO2	Measure Resistance, Inductance and capacitance using AC and DC bridges.
CO3	Determine the magnetization characteristics and hysteresis loss of iron specimen using BH curve
CO4	Calibrate single phase and three phase energy meters used in domestic and commercial applications
CO5	Simulate modelling parameters of electrical machines

HS P53-GENERAL PROFICIENCY-1	
CO1	To understand and practice the art of communication
CO2	able to practice and showcase soft skills.
CO3	To understand the importance of writing.
CO4	To practice speaking skill.




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CO5	To practice verbal, non verbal and numerical aptitude.
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SEMESTER VI

EE T61-Power System Analysis	
CO 1	To analyze the various operation of power system Components & to determine per unit diagram and bus admittance matrix.
CO 2	To analyze the Formulation of various types of load flow equations & line voltages and real and reactive powers.
CO 3	Ability to learn about various types of faults in sequence networks.
CO 4	Compute the fault currents for L-G, L-L, and L-L-G faults by analyzing a power system's sequence network.
CO 5	To analyze and understand about classification of Power System Stability Model and System Equivalents problems.

EE T62-Utilization of Electrical Energy	
CO 1	To have a basic engineering knowledge in Illumination models and its working.
CO 2	To have a knowledge in electric heating & welding and its types.
CO 3	To analyse the characteristics of a motor load and power factor improvement.
CO 4	To understand about A.C traction and about recent trend in Metro rails.
CO 5	To determine and analyse about the electrolytic process and about energy auditing-Energy Conservation techniques or domestic and industrial applications.

EE T63-Microprocessors and Microcontrollers	
CO 1	Illustrate the architecture of microprocessor and to develop skills in writing assembly language program.
CO 2	Have a clear understanding of microcontroller architecture with functional details of each pin.
CO 3	Write and debug Assembly and C programs for 8 bit Microcontroller.
CO 4	Interface input/output peripheral devices and to implement the advanced communication protocol like DC and SPI using PIC Microcontroller.
CO 5	Design and develop microcontroller based real-time applications.



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EE T64-Electrical Machine Design	
CO 1	To understand about the basic concepts of electric design & to analyse the concepts.
CO 2	Ability to solve and design the parts of electric machine.
CO 3	Ability to solve and design the parts of transformer.
CO 4	Ability to solve and design the three phase induction motor.
CO 5	Ability to solve and design the synchronous machine and to understand the basic knowledge of computer aided design.

EE T65 Digital Signal Processing	
CO 1	Analyze the classifications of signals and systems in the time and frequency domains
CO 2	Perform the stability analysis of discrete time system.
CO 3	Acquire knowledge on spectral analysis of signals.
CO 4	Design, analyse and compare digital filters for processing of discrete time signals.
CO 5	Acquire knowledge on DSP architecture and implement DFT and FFT. Algorithms in DSP.

EE E06 SPECIAL ELECTRICAL MACHINES	
CO 1	Understand the constructional features, principle of operation, Modes of operation of Stepper motor Classify the Types of motors, Drive system and circuit control of Stepper motor Analyze Static and Dynamic Characteristics Explain its Applications.
CO 2	Understand Constructional details, principles of operation of switched reluctance motor. Analyze its characteristics, torque, drive and its regulation. Explain the control and Applications.
CO 3	Understand Constructional features and principle of synchronous reluctance motor and vernier motor. Classify its Types Reluctance and analyze the Phasor diagram and its Characteristics.
CO 4	Remember the Commutation in DC motors. Differentiate between mechanical and electronic commutators. Understand Principle of operation, Construction and drive circuits. Analyze Torque and emf equation, Torque and Speed characteristics. Explain sensors and sensor less systems, controllers and applications.
CO 5	Understand principles of operation constructional features, characteristics and application of permanent magnet synchronous motor and doubly fed



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	induction generator. Analyze phasor diagram, torque speed characteristic and applications.
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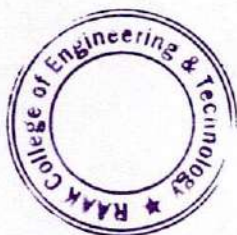
EE P61-POWER ELECTRONICS LABORATORY	
CO 1	Understand the operation of power electronic devices and its applications
CO 2	Analyze the I-V characteristics of SCR, DIAC and TRIAC.
CO 3	Analyze the characteristics of IGBT and UJT
CO 4	Illustrate the functioning of rectifiers and firing circuits.
CO 5	Distinguish the speed control of DC motor using converters.

EE P62-MICROPROCESSOR AND MICROCONTROLLER LAB	
CO 1	Develop assembly language program for microprocessor 8085.
CO 2	Analyze various platforms for programming by knowing the complete hardware configurations
CO 3	Analyze abstract problems and apply a combination of hardware and software to address the problem.
CO 4	Design a control algorithm various applications using microcontrollers.
CO 5	Design and generate pulses for real time electrical applications.

HS P63-GENERAL PROFICIENCY-II	
CO 1	Understand the composition analysis.
CO 2	Developing letter and resume writing skills.
CO 3	Understand and practice oral skills through group discussions and negotiation activities.
CO 4	Practice corporate etiquette, grooming and dressing.
CO 5	Practice verbal, non-verbal and numerical aptitude.

SEMESTER VII

EE T71 INDUSTRIAL MANAGEMENT	
CO 1	To understand the concepts of engineering economics.
CO 2	Ability to understand key managerial decisions method like make or buy decision and some examples in all methods.
CO 3	Ability to learn the administrative capabilities.



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CO 4	To understand the principles of management and types of management
CO 5	To impart knowledge in financial management and about accounting.

EE T72-SOLID STATE DRIVES	
CO 1	To understand the fundamentals of electric drive and converter fed DC motor drives.
CO 2	To examine the operation of chopper fed dc drives.
CO 3	To impart the knowledge in control methods for the induction motor drives.
CO 4	To analyse the performance of induction motor drive.s
CO 5	To know about the control of synchronous motor and basic knowledge about vector control.

EE T73-POWER SYSTEM OPERATION AND CONTROL	
CO 1	To analyse and control the P-F and Q-V loop disturbances & about SCADA system.
CO 2	To know about the load forecast, unit commitment & dynamic programming method.
CO 3	To impart about the real power-frequency and Reactive power.
CO 4	To know about the dispatch schedule solving through iteration method.
CO 5	To know about the voltage controller and its characteristics and basic knowledge in compensating equipment.

EE E12-RENEWABLE ENERGY SOURCES	
CO 1	To know in detail about the importance and limitations of renewable energies in present Indian and International energy scenario.
CO 2	To learn about the solar energy harnessing methods.
CO 3	To understand the working of different types of wind power plants and blade design.
CO 4	To understand about the working of several renewable energy systems such as tidal energy, ocean thermal energy.
CO 5	To get a knowledge about the Bio-energy & Energy from the Agricultural wastes Applications.

EE E16-POWER SYSTEM RESTRUCTURING AND DEREGULATION	
CO 1	Understand the structure of an electricity market in either regulated or deregulated market conditions.



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CO 2	Describe the operational activities in Generation, Transmission and Distribution system in the restructured environment.
CO 3	Interpret the impact of open access in distribution system.
CO 4	To understand the need for restructured power system along with electricity market models.
CO 5	Outline the Indian power sector.


EE-P71-POWER SYSTEM SIMULATION LAB	
CO 1	To get familiar with the Finite Element (FE) modelling of structural elements with loading and boundary conditions
CO 2	To understand and apply the structural and dynamic analysis of structural elements
CO 3	To understand and apply the types thermal and dynamic analysis of structural elements.
CO 4	To learn and solve core mechanical engineering problems using MATLAB computational package.
CO 5	Explain Verification and Validation of simulation model.

EE PW7-PROJECT PHASE I	
CO 1	Motivate students to select application related projects.
CO 2	Students study the reference papers from various domain and select domain of their wish.
CO 3	Students have detailed survey on selected domain and identify base paper and give presentation.
CO 4	Students identified problem formulation of their existing work.
CO 5	Students performed survey, identified the base paper, problem formulation and gave presentation.

EE P72-SEMINAR	
CO 1	Students must be able to make critical review of literature.
CO 2	Preparation of report on the topic.

EE P73-INDUSTRIAL VISIT/TRAINING	
CO 1	Student can gain knowledge through visiting industry.
CO 2	Student can gain practical knowledge through internship.




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SEMESTER VIII

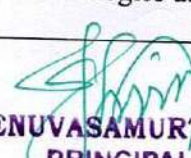
EE T81-PROTECTION AND SWITCHGEAR	
CO 1	To understand the different protection zones and protection schemes in power system.
CO 2	Analyse the different applications of the relays in power system.
CO 3	To impart knowledge on protection schemes for generator, transformer, motor, feeder and transmission lines
CO 4	To acquaint the various types of surge protection and earthing.
CO 5	Comprehend the various circuit breakers (AC and DC) used in power system.

EE T82-Professional Ethics Practice	
CO 1	Define and Identify different life skills required in personal and professional life.
CO 2	Develop an awareness of the self and apply well-defined techniques to cope with emotions and stress.
CO 3	Explain the basic mechanics of effective communication and demonstrate these through presentations and take part in group discussions.
CO 4	Use appropriate thinking and problem solving techniques to solve new problems.
CO 5	Understand the basics of teamwork and leadership.

EE E15-HVDC TRANSMISSION	
CO 1	Distinguish between the usage of EHVAC and HVDC transmission systems
CO 2	Judge when and where to use EHVAC/HVDC transmission systems in practice.
CO 3	Design implementation circuitry for various controllers used in HVDC transmission systems.
CO 4	Plan appropriate electric power transmission system between two destinations.
CO 5	To satisfy the pre-defined load requirement without compromising the technical performance.

EE E19-SMART GRID	
CO 1	Compare the conventional electrical grid concepts with smart grid.
CO 2	Outline about the protocols and networks used in Smart grid.
CO 3	Explain the importance of WAM and energy storage technologies used in smart grid.




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CO 4	Acquire knowledge on distributed generation and micro grids in smart grid.
CO 5	Analyze the power quality issues in smart grid.

EE PW8-Project Phase II	
CO 1	Identify the problem statement for the project work through the literature survey.
CO 2	Choose the proper components as per the requirements of the design/system.
CO 3	Apply the acquainted skills to develop final model/system.
CO 4	Estimate, plan and execute the project as a team.
CO 5	Explore the possibility of publishing papers in peer reviewed journals/conference proceedings.

EE P81-Comprehensive Viva	
CO 1	Demonstrate the knowledge the program domain.
CO 2	Present the views suitable for career progression.
CO 3	Exhibit the strength in previous semester subjects.
CO 4	To demonstrate on new innovation topics.
CO 5	Ability to understand the depth knowledge in core industries.




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