St.JOSEPH'S COLLEGE OF ENGINEERING AND ENGINEERING,THANJAVUR

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE OUTCOME

Regulation : 2021

S. No	Semester	Course Code	Course Name	Course Outcome
1	I SEM	HS3152	Professional English - I	To use appropriate words in a professional context
				To gain understanding of basic grammatic structures and use them in right context
				To read and infer the denotative and connotative meanings of technical texts
				To write definitions, descriptions, narrations and essays on various topics
				To communicate effectively and appropriately in real life
2		MA3151	Matrices and Calculus	Use the matrix algebra methods for solving practical problems.
				Apply differential calculus tools in solving various application problems
				Able to use differential calculus ideas on several variable functions
				Apply different methods of integration in solving practical problems
				Apply multiple integral ideas in solving areas, volumes and other practical problems
3		PH3151	Engineering Physics	Understand the importance of mechanics
				Express their knowledge in electromagnetic waves.
				Demonstrate a strong foundational knowledge in oscillations, optics and lasers.
				Understand the importance of quantum physics.
				Comprehend and apply quantum mechanical principles towards the formation of energy bands.
4		CY3151	Engineering Chemistry	To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water
				To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications
				To apply the knowledge of phase rule and composites for material selection requirements.
				To recommend suitable fuels for engineering processes and applications
				To recognize different forms of energy resources and apply them for suitable applications in energy sectors.
5		GE3151	Problem Solving and Python Programming	Develop algorithmic solutions to simple computational problems
				Develop and execute simple Python programs.
				Write simple Python programs using conditionals and loops for solving problems.
				Decompose a Python program into functions.
				Represent compound data using Python lists, tuples, dictionaries etc.
6		GE3152	Heritage of Tamils	NIL
7	II SEM	HS3252	Professional English-II	To compare and contrast products and ideas in technical texts.
				To identify and report cause and effects in events, industrial processes through technical texts
				To analyse problems in order to arrive at feasible solutions and communicate them in the written format.
				To present their ideas and opinions in a planned and logical manner
				To draft effective resumes in the context of job search.
8		MA3251	Statistics and Numerical Methods	Apply the concept of testing of hypothesis for small and large samples in real life problems.
				Apply the basic concepts of classifications of design of experiments in the field of agriculture.
				Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
				Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
				Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications
9		GE3251	Engineering Graphics	Use BIS conventions and specifications for engineering drawing.
				Construct the conic curves, involutes and cycloid.
				Solve practical problems involving projection of lines.
				Draw the orthographic, isometric and perspective projections of simple solids.
				Draw the development of simple solids.
10		PH3202	Physics for Electrical Engineering	Know basics of dielectric materials and insulation.
				Gain knowledge on the electrical and magnetic properties of materials and their applications
				Understand clearly of semiconductor physics and functioning of semiconductor devices
				Understand the optical properties of materials and working principles of various optical devices
				Appreciate the importance of nanotechnology and nanodevices.
11		BE3255	Basic Civil and Mecahnical Engineering	Understanding profession of Civil and Mechanical engineering.
				Summarise the planning of building, infrastructure and working of Machineries.
				Apply the knowledge gained in respective discipline
				Illustrate the ideas of Civil and Mechanical Engineering applications.
				Appraise the material, Structures, machines and energy.
12		EE3251	Electric Circuit Analysis	Explain circuit's behavior using circuit laws.
				Apply mesh analysis/ nodal analysis / network theorems to determine behavior of the given DC and AC circuit
				Compute the transient response of first order and second order systems to step and sinusoidal input
				Compute power, line/ phase voltage and currents of the given three phase circuit
				Explain the frequency response of series and parallel RLC circuits
13		GE3252	தமி• ம் ெதாழி• ட்ப• ம் / Tamils and Technology	NIL
14	III SEM	MA3303	Probability and Complex Functions	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.
				Understand the basic concepts of one and two dimensional random variables and apply
				To develop an understanding of the standard techniques of complex variable theory in particular analytic function and its mapping property
				To familiarize the students with complex integration techniques and contour integration techniques which can be used in real integrals
				To acquaint the students with Differential Equations which are significantly used in engineering problems.
15		EE3301	Electromagnetic Fields	Visualize and explain Gradient, Divergence, and Curl operations on electromagnetic vector fieldsand identify the electromagnetic sources and their effects.
				Compute and analyse electrostatic fields, electric potential, energy density along with their applications.
				Compute and analyse magneto static fields, magnetic flux density, vector potential along with their applications.
				Explain different methods of emf generation and Maxwell's equations
				Explain the concept of electromagnetic waves and characterizing parameters
16		EE3302	Digital Logic Circuits	Explain various number systems and characteristics of digital logic families
				Apply K-maps and Quine McCluskey methods to simplify the given Boolean expressions
				Explain the implementation of combinational circuit such as multiplexers and de multiplexers - code converters, adders, subtractors, Encoders and Decoders
				Design various synchronous and asynchronous circuits using Flip Flops
				Explain asynchronous sequential circuits and programmable logic devices
				Use VHDL for simulating and testing RTL, combinatorial and sequential circuits
17		EC3301	Electron Devices and Circuits	Explain the structure and operation of PN junction devices (diode, Zener diode, LED and Laser diode)
				Design clipper, clamper, half wave and full wave rectifier, regulator circuits using PN junction diodes
				Analyze the structure and characteristics BJT, FET, MOSFET, UJT, Thyristor and IGBT
				Analyze the performance of various configurations of BJT and MOSFET based amplifier
				Explain the characteristics of MOS based cascade and differential amplifier
				Explain the operation of various feedback amplifiers and oscillators
18		EE3303	Electrical Machines - I	Apply the laws governing the electromechanical energy conversion for singly and multiple excited systems
				Explain the construction and working principle of DC machines
				Interpret various characteristics of DC machines.
				Compute various performance parameters of the machine, by conducting suitable tests.
				Draw the equivalent circuit of transformer and predetermine the efficiency and regulation.
				Describe the working principle of auto transformer, three phase transformer with different types of connections.
19		CS3353	C Programming and Data Structures	Develop C programs for any real world/technical application.
				Apply advanced features of C in solving problems
				Write functions to implement linear and non–linear data structure operations.
				Suggest and use appropriate linear/non–linear data structure operations for solving a given problem.
				Appropriately use sort and search algorithms for a given application
				Apply appropriate hash functions that result in a collision free scenario for data storage and retrieval.

20		GE3451	Environmental Sciences and Sustainability	To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation
				To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society
				To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations
				To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development.
				To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.
21		EE3401	Transmission and Distribution	Understand the structure of power system, computation of transmission line parameters for different configurations
				Model the transmission lines to determine the line performance and to understand the impact of Ferranti effect and corona on line performance
				Do Mechanical design of transmission lines, grounding and to understand about the insulators in transmission system.
				Design the underground cables and understand the performance analysis of underground cable
				Understand the modelling, performance analysis and modern trends in distribution system.
22	**IV SEM**	EE3402	Linear Integrated Circuits	Explain monolithic IC fabrication process
				Explain the fabrication of diodes, capacitance, resistance, FETs and PV Cell.
				Analyze the characteristics and basic applications (inverting/non-inverting amplifier, summer, differentiator, integrator, V/I and I/V converter) of Op-Amp
				Explain circuit and applications of op-amp based instrumentation amplifier, log/antilog amplifier, analog multiplier /divider, active filters, comparators, waveform generators, A/D and D/A converters
				Explain Functional blocks, characteristics and applications of Timer, PLL, analog multiplier ICs.
				Explain the applications of ICs in Instrumentation amplifier, fixed and variable voltage regulator, SMPS and function generator
23		EE3403	Measurements and Instrumentation	Ability to understand the fundamental art of measurement in engineering.
				Ability to understand the structural elements of various instruments.
				Ability to understand the importance of bridge circuits
				Ability to understand about various transducers and their characteristics by experiments.
				Ability to understand the concept of digital instrumentation and virtual instrumentation by experiments.
24		EE3404	Microprocessor and Microcontroller	Ability to write assembly language program for microprocessor and microcontroller
				Ability to design and implement interfacing of peripheral with microprocessor and microcontroller
				Ability to analyze, comprehend, design and simulate microprocessor based systems used for control and monitoring.
				Ability to analyze, comprehend, design and simulate microcontroller based systems used for control and monitoring.
				Ability to understand and appreciate advanced architecture evolving microprocessor field
25		EE3405	Electrical Machines - II	Ability to understand the construction and working principle of Synchronous generator
				Ability to understand the construction and working principle of Synchronous Motor
				Ability to understand the construction and working principle of Three Phase Induction Motor
				Acquire knowledge about the starting and speed control of induction motors
				To gain knowledge about the basic principles and working of Single phase induction motors and Special Electrical Machines
26	**V SEM**	EE3501	Power System Analysis	Ability to model the power system under steady state operating condition.
				Ability to carry out power flow analysis using
				Ability to infer the significance of short circuit studies in designing circuit breakers.
				Ability to analyze the state of the power system for various unsymmetrical faults
				Ability to analyze the stability of power system using different methods.
27		EE3591	Power Electronics	Understand the operation of semiconductor devices and dynamic characteristics and to design &analyze the low power SMPS
				Analyze the various uncontrolled rectifiers and design suitable filter circuits
				Analyze the operation of the n-pulse converters and evaluate the performance parameters
				Understand various PWM techniques and apply voltage control and harmonic elimination methods to inverter circuits.
				Understand the operation of AC voltage controllers and its applications.
28		EE3503	Control Systems	Represent simple systems in transfer function and state variable forms.
				Analyze simple systems in time domain.
				Analyze simple systems in frequency domain.
				Infer the stability of systems in time and frequency domain.
				Interpret characteristics of the system and find out solution for simple control problems.
29		EE3001	Utilization and Conservation of Electrical Energy	Ability to choose suitable electric drives for different applications
				Ability to design the illumination systems for energy saving
				Ability to demonstrate the utilization of electrical energy for heating and welding purposes
				Ability to demonstrate the utilization of electrical energy for heating and welding purposes
				Ability to do electric connection for any domestic appliance like refrigerator, battery charging circuit for a specific household application.
				To illustrate the need for energy conservation and to simulate three phase power control.
30		EE3004	HVDC and FACTS	Identify and understand the problems in AC Transmission systems and understand the need for Flexible AC transmission system and HVDC Transmission
				Understand the operation and control of SVC and TCSC and its applications to enhance the stability and damping
				Analyze basic operation and control of voltage source converter based FACTS controllers.
				Demonstrate basic operation and control of Line commutated HVDC Transmission.
				Explain the d-q control based operation of VSC based HVDC Transmission.
31		EE3037	Power System Transients	Explain the principles of transients and its concepts.
				Know the different types of switching transients and the way to draw the necessary equivalent circuit.
				Explain the concepts behind lightning and the way to protect the same.
				Compute the transient behavior in transmission line.
				Explain the behavior of the circuit during switching and to learn the simulation tool.
32		MX3084	MANDATORY COURSE - 1* (DISASTER RISK REDUCTION AND MANAGEMENT)	To impart knowledge on the concepts of Disaster, Vulnerability and Disaster Risk reduction (DRR)
				To enhance understanding on Hazards, Vulnerability and Disaster Risk Assessment prevention and risk reduction
				To develop disaster response skills by adopting relevant tools and technology
				Enhance awareness of institutional processes for Disaster response in the country
				Develop rudimentary ability to respond to their surroundings with potential Disaster response in areas where they live, with due sensitivity
33		EE3601	Protection and Switchgear	Understand and select proper protective scheme and type of earthing.
				Explain the operating principles of various relays
				Suggest suitable protective scheme for the protection of various power system apparatus.
				Analyze the importance of static relays and numerical relays in power system protection.
				Summarize the merits and demerits and application areas of various circuit breakers.
34		EE3602	Power system Operation and Control	Understand the day – to – day operation of power system.
				Model and analyse the control actions that are implemented to meet the minute-to minute variation of system real power demand.
				Model and analyze the compensators for reactive power control and various devices used for voltage control.
				Prepare day ahead and real time economic generation scheduling.
				Understand the necessity of computer control of power systems
35		EE3007	Smart Grids	Understand the importance and objectives of power system grid.
				Know and understand the concept of a smart grid
				Discuss smart metering devices and associated technologies.
				Overview of microgrid and Electric Vehicle Technology.
				Knowledge on the various computing technologies; to understand the role of Big Data and IoT for effective and efficient operation of Smart Grid.
36		EE3033	Hybrid Energy Technology	Analyze the impacts of hybrid energy technologies on the environment and demonstrate them to harness electrical power
				Select a suitable Electrical machine for Wind Energy Conversion Systems and simulate wind energy conversion system.
				Design the power converters such as AC-DC, DC-DC, and AC-AC converters for SPV systems.
				Analyze the power converters such as AC-DC, DC-DC, and AC-AC converters for Hybrid energy systems.
				Interpret the hybrid renewable energy systems.
37	**VI SEM**	EE3036	Sustainable and Environmental Friendly HV Insulation System	Know about sustainable and environmental energy and products.
				Describe the alternate green gaseous insulators.
				Describe the alternate green liquid insulators
				Describe the alternate green solid insulators
				Elaborate the standards for green insulation systems.
38		MX3089	MANDATORY COURSE - 2* (Industrial Safety)	Understand the basic concept of safety.
				Obtain knowledge of Statutory Regulations and standards.
				Know about the safety Activities of the Working Place.
				Analyze on the impact of Occupational Exposures and their Remedies
				Obtain knowledge of Risk Assessment Techniques.

39		EE3701	High Voltage Engineering	Explain various overvoltage's and its effects on power system.
				Understanding the breakdown phenomena in different medium under uniform and non uniform fields.
				Explain the methods of generating and measuring high DC, AC, impulse voltage and currents.
				suggest and conduct suitable HV testing of Electrical power apparatus as per standards.
				Explain the industrial Applications of Electrostatic fields.
40		GE3791	Human Values and Ethics	Identify the importance of democratic, secular and scientific values in harmonious functioning of social life
				Practice democratic and scientific values in both their personal and professional life.
				Find rational solutions to social problems.
				Behave in an ethical manner in society
				Practice critical thinking and the pursuit of truth
41		GE3751	Principles of Management	Understanding of managerial functions like planning, organizing, staffing, leading & controlling.
				Basic knowledge on international aspect of management.
				Understand management concept of organizing.
				Understand management concept of directing.
				Understand management concept of controlling.
42	**VII SEM**	CME365	Renewable Energy Technologies	Discuss the Indian and global energy scenario.
				Describe the various solar energy technologies and its applications.
				Explain the various wind energy technologies.
				Explore the various bio-energy technologies.
				Discuss the ocean and geothermal technologies.
43		OCH353	Energy Technology	Describe the fundamentals and main characteristics of renewable energy sources and their differences compared to fossil fuels.
				Professionals in the various fields of energy engineering
				Compare different renewable energy technologies and choose the most appropriate based on local conditions
				Explain the technological basis for harnessing renewable energy sources.
				Identify and critically evaluate current developments and emerging trends within the field of renewable energy technologies and to develop in-depth technical understanding of energy problems .
44		EE3018	Embedded Processors	Interpret the basics and functionality of processor functional blocks.
				Observe the specialty of RISC processor functional blocks.
				Incorporate the I/O hardware interface of processor with peripherals.
				Emphasis the communication features of the processor.
				Improved Employability and entrepreneurship capacity due to knowledge up gradation on recent trends in commercial embedded processors.
45	**VIII SEM**	EE3811	Project Work/Internship	Interprete, analyze and provide solutions to complex engineering and societal issues by applying knowledge gained on basics of science and Engineering.
				Choose, conduct and demonstrate a sound technical knowledge of their selected project topics in the field of power components, protection, high voltage, electronics, process automation, power electronics and drives instrumentation and control by exploring suitable engineering and IT tools
				Understand, formulate and propose new learning algorithms to solve engineering and societal problems of moderate complexity through multidisciplinary projects understanding commitment towards sustainable development
				Demonstrate, prepare reports, communicate and work in a team as a member/leader by adhering to ethical responsibilities.
				Acknowledge the value of continuing education for oneself and to stay up with technology advancements.