

JP COLLEGE OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE OUTCOME

Regulation : 2021

S. No	Sem	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	Enngineering 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.			
10	PH3251	Material Science	Know basics of crystallography and its importance for varied materials properties	
			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 functional nanoelectronic devices.	
11	BE3251	Basic Electrical, and Electronics Engineering	Compute the electric circuit parameters for simple problems	
			Explain the working principle and applications of electrical machines	
			Analyze the characteristics of analog electronic devices	
			Explain the basic concepts of digital electronics	
12	GE3252	Tamils and Technology	NIL	
13	MA 3351	Transforms and partial	Understand how to solve the given standard partial differential equations.	
			Solve differential equations using Fourier series analysis which plays a vital role in engineering applications	
			Appreciate the physical significance of Fourier series techniques in solving one- and two-dimensional heat flow problems and one-dimensional wave equations.	

13	III Sem	ME3351	differential equations	Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering. Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems
14		ME3351	Engineering Mechanics	Illustrate the vector and scalar representation of forces and moments Analyse the rigid body in equilibrium Evaluate the properties of distributed forces Determine the friction and the effects by the laws of friction Calculate dynamic forces exerted in rigid body
15		ME3391	Engineering Thermodynamics	Apply the zeroth and first law of thermodynamics by formulating temperature scales and calculating the property changes in closed and open engineering systems. Apply the second law of thermodynamics in analysing the performance of thermal devices through energy and entropy calculations. Apply the second law of thermodynamics in evaluating the various properties of steam through steam tables and Mollier chart Apply the properties of pure substance in computing the macroscopic properties of ideal and real gases using gas laws and appropriate thermodynamic relations. Apply the properties of gas mixtures in calculating the properties of gas mixtures and applying various thermodynamic relations to calculate property changes.
16		CE3391	Fluid mechanics and Machinery	Understand the properties and behaviour in static conditions. Also, to understand the conservation laws applicable to fluids and its application through fluid kinematics and dynamics Estimate losses in pipelines for both laminar and turbulent conditions and analysis of pipes connected in series and parallel. Also, to understand the concept of boundary layer and its thickness on the flat solid surface. Formulate the relationship among the parameters involved in the given fluid phenomenon and to predict the performances of prototype by model studies Explain the working principles of various turbines and design the various types of turbines. Explain the working principles of centrifugal, reciprocating and rotary pumps and design the centrifugal and reciprocating pumps
17		ME3392	Engineering Materials and Metallurgy	Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification. Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes. Clarify the effect of alloying elements on ferrous and non-ferrous metals. Summarize the properties and applications of non-metallic materials. Explain the testing of mechanical properties.
18		ME3393	Manufacturing Processes	Explain the principle of different metal casting processes. Describe the various metal joining processes Illustrate the different bulk deformation processes. Apply the various sheet metal forming process.

				Apply suitable molding technique for manufacturing of plastics components.
19	IV Sem	ME3491	Theory of Machines	Discuss the basics of mechanism Solve problems on gears and gear trains. Examine friction in machine elements. Calculate static and dynamic forces of mechanisms. Calculate the balancing masses and their locations of reciprocating and rotating masses. Computing the frequency of free vibration, forced vibration and damping coefficient.
20		ME3451	Thermal Engineering	Apply thermodynamic concepts to different air standard cycles and solve problems. To solve problems in steam nozzle and calculate critical pressure ratio. Explain the flow in steam turbines, draw velocity diagrams, flow in Gas turbines and solve problems. Explain the functioning and features of IC engine, components and auxiliaries. Calculate the various performance parameters of IC engines
21		ME3492	Hydraulics and Pneumatics	Apply the working principles of fluid power systems and hydraulic pumps. Apply the working principles of hydraulic actuators and control components. Design and develop hydraulic circuits and systems. Apply the working principles of pneumatic circuits and power system and its components. Identify various troubles shooting methods in fluid power systems.
22		ME3493	Manufacturing Technology	Apply the mechanism of metal removal process and to identify the factors involved in improving machinability. Describe the constructional and operational features of centre lathe and other special purpose lathes. Describe the constructional and operational features of reciprocating machine tools. Apply the constructional features and working principles of CNC machine tools. Demonstrate the Program CNC machine tools through planning, writing codes and setting up CNC machine tools to manufacture a given component.
23		CE3491	Strength of Materials	Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes. Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment. Apply basic equation of torsion in designing of shafts and helical springs Calculate slope and deflection in beams using different methods. Analyze thin and thick shells for applied pressures.
24		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.	
25	VSEM	ME3591	Design of Machine Elements	Explain the design machine members subjected to static and variable loads.	
				Apply the concepts design to shafts, key and couplings.	
				Apply the concepts of design to bolted, Knuckle, Cotter, riveted and welded joints.	
				Apply the concept of design helical, leaf springs, flywheels, connecting rods and crank shafts.	
				Apply the concepts of design and select sliding and rolling contact bearings, seals and gaskets.	
26		ME3592	Metrology and Measurements	Discuss the concepts of measurements to apply in various metrological instruments.	
				Apply the principle and applications of linear and angular measuring instruments, assembly and transmission elements.	
				Apply the tolerance symbols and tolerance analysis for industrial applications.	
				Apply the principles and methods of form and surface metrology.	
					Apply the advances in measurements for quality control in manufacturing Industries.
27		CME380	Automobile Engineering	Recognize the various parts of the automobile and their functions and materials.	
				Discuss the engine auxiliary systems and engine emission control.	
				Distinguish the working of different types of transmission systems.	
				Explain the Steering, Brakes and Suspension Systems.	
				Predict possible alternate sources of energy for IC Engines.	
28	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.	
29	CME387	Non Traditional Machining Processes	Formulate different types of non-traditional machining processes and evaluate mechanical energy based non-traditional machining processes.		
			Illustrate chemical and electro chemical energy based processes.		
			Evaluate thermo-electric energy based processes.		
			Interpret nano finishing processes.		
			Analyse hybrid non-traditional machining processes and differentiate non- traditional machining processes.		
30	MX3084	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		
				Apply heat conduction equations to different surface configurations under steady state and transient conditions and solve problems.	

31	VI SEM	ME8691	Heat and Mass Transfer	Apply free and forced convective heat transfer correlations to internal and external flows through/over various surface configurations and solve problems.
				Explain the phenomena of boiling and condensation, apply LMTD and NTU methods of thermal analysis to different types of heat exchanger configurations and solve problems.
				Explain basic laws for Radiation and apply these principles to radiative heat transfer between different types of surfaces to solve problems.
				Apply diffusive and convective mass transfer equations and correlations to solve problems for different applications.
32	VI SEM	CME389	Design of Transmission Systems	Apply the concepts of design to belts, chains and rope drives.
				Apply the concepts of design to spur, helical gears.
				Apply the concepts of design to worm and bevel gears.
				Apply the concepts of design to gear boxes.
33	VI SEM	CME348	Modern Robotics	Discuss the definition, history of robotics and robot anatomy.
				Develop the simulation of robot kinematics
				Describe the grasping and manipulation of robots.
				Explain about mobile robot and manipulation.
34	VI SEM	CME335	CAE and CFD Approach in Future Mobility	Discuss the applications of industrial, service, domestic robots.
				discuss the basic concept of the CAE /CFD
				Develop the computer aided design and rapid prototyping.
				Discuss the basic concept of Finite Element methods.
35	VI SEM	OCS353	Data Science Fundamentals	discuss the concepts of computational fluid dynamics
				solving the problem and simulation using computational fluid dynamics.
				Gain knowledge on data science process.
				Perform data manipulation functions using Numpy and Pandas.
36	VI SEM	MX3089	Industrial Safety	Understand different types of machine learning approaches.
				Perform data visualization using tools.
				Handle large volumes of data in practical scenarios.
				Understand the basic concept of safety.
36	VI SEM	MX3089	Industrial 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.