

DEPARTMENT OF MECHANICAL ENGINEERING

Name of subject	CO No.	Course Outcomes
Engineering mathematic - III	CO.1	Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits.
	CO.2	Solve problem related to Fourier transform and application to Communication systems and Signal processing.
	CO.3	Obtain Interpolating polynomials, numerically differentiate and integrate functions, numerical solutions of differential equations using single step and multi-step iterative methods used in modern scientific computing.
	CO.4	Perform vector differentiation and integration, analyze the vector fields and apply to Electromagnetic fields.
	CO.5	Analyze conformal mappings, transformations and perform contour integration of complex functions in the study of electrostatics and signal processing.
Fluid mechanics	CO.1	Determine various Fluid Properties and Fluid Statics
	CO.2	Analyze Fluid Kinematics and Dynamics
	CO.3	Analyze Laminar Flow and Turbulent Flow
	CO.4	Evaluate Forces on Immersed Bodies and Boundary Layer Theory
	CO.5	Apply dimensional analysis
Thermodynamics	CO.1	Students will be able to Define the terms like system, boundary, properties, equilibrium, work, heat, ideal gas, entropy etc. Used in thermodynamics.
	CO.2	Students will be able to Studied different laws of thermodynamics and apply these to simple thermal systems to study energy balance.
	CO.3	Students will be able to Studied Entropy, application and disorder.
	CO.4	Studied various types of processes like isothermal, adiabatic, etc. Considering system with ideal gas and represent them on p-v and T-s planes.
	CO.5	Represent phase diagram of pure substance (steam) on different thermodynamic planes like p-v, T-s, h-s, etc. Show various constant property lines on them.
Materials science and metallurgy	CO1	Study various crystal structures of materials to understand mechanical properties of materials and calculations of same using appropriate equations
	CO2	Evaluate phase diagrams of various materials
	CO3	Suggest appropriate heat treatment process for a given application

	CO4	Prepare samples of different materials for metallography
	CO5	Recommend appropriate ndt technique for a given application
Machine Drawing and CAD Lab	CO.1	Interpret the object with the help of given sectional and orthographic views.
	CO.2	Construct the curve of intersection of two solids
	CO.3	Draw machine element using keys, cotter, knuckle ,bolted and welded joints
	CO.4	Assemble details of any given parts i.e. valve. pumps, machine tool parts etc.
	CO.5	Represent tolerances and level of surface finish on production drawing
	CO6	Understand various creating and editing commands in auto cad.
Manufacturing process-I	CO1	Identify castings processes, working principles and applications and list various defects in metal casting
	CO2	Understand the various metal forming processes, working principles and applications
	CO3	Classify the basic joining processes and demonstrate principles of welding, brazing and soldering.
	CO4	Study center lathe and its operations including plain, taper turning, work holding devices and cutting tool
	CO5	Understand milling machines and operations, cutters and indexing for gear cutting
	CO6	Study shaping, planning and drilling, their types and related tooling's
Strength of materials	CO.1	Students will be able to state the basic definitions of fundamental terms such as axial load, eccentric load, stress, strain, e, principle stresses, etc.
	CO.2	Students will be able to analyze the stresses and strain energy in different load cases and also able to design the columns based on deflection
	CO.3	Students will be able to design a beam based on bending and shafts based on torsion
	CO.4	Students will be able to analyze given beam for calculations of sf and bm

	CO.5	Students will be able to calculate slope and deflection at a point on cantilever /simply supported beam using double integration, area-moment and superposition methods
Sheet metal engineering	CO1	Recognize common manufacturing processes of sheet metal fabrications.
	CO2	Design & fabrication of sheet metal products & recognize common material used in industry.
	CO3	Distinguish shearing, drawing & pressing processes.
	CO4	Students able to know types of dies & formability.
	CO5	Select mechanical & hydraulic presses for the given process.
Machine design - I	CO.1	Formulate the problem by identifying customer need and convert into design Specification
	CO.2	Understand component behavior subjected to loads and identify the the stress strain induced in the component in relation with failure criteria.
	CO.3	Design of machine component using theories of failures
	CO.4	Design of component for finite life and infinite life when subjected to fluctuating load
	CO.5	Design of components like shaft, key, coupling, screw and spring
Theory of machines- II	CO.1	Students will be able to explain the terms related to belt and rope drive and their applications in engineering.
	CO.2	Students will be able to explain the terms related to toothed gear and their applications in engineering.
	CO.3	Student will be able to calculate velocity ratio for given gear train
	CO.4	Students will able to understand gyroscopic effects in ships, aero planes, and road vehicles.
	CO.5	Students will be able to understand free and forced vibrations of single degree freedom systems
Automobile engineering	CO.1	Students will be able to identify the different parts of the automobile.
	CO.2	Students will be able to explain the working of various parts like engine, transmission, clutch, brakes etc.
	CO.3	Students will be able to identify and demonstrate various types of drive systems; front and rear wheels, two and four wheel drive
	CO.4	Students will be able to apply vehicle troubleshooting and maintenance procedures.
	CO.5	Students will be able to analyze the environmental implications of automobile emissions. And suggest suitable regulatory modifications.
Applied thermodynamics	CO.1	Define the terms like calorific value of fuel, stoichiometric air-fuel ratio, excess air, equivalent evaporation, boiler efficiency, etc. Calculate minimum air required for combustion of fuel.
	CO.2	Studied and Analyze gas power cycles and vapour power cycles and derive expressions for the performance parameters like thermal efficiency.

	CO.3	Classify various types of boiler, nozzle, steam turbine and condenser used in steam power plant.
	CO.4	Classify various types of condenser, nozzle and derived equations for its efficiency.
	CO.5	Draw P-v diagram for single-stage reciprocating air compressor, with and without clearance volume and evaluate its performance. Differentiate between reciprocating and rotary air compressors.
Manufacturing processes- II	CO1	Understand the process of powder metallurgy and its applications
	CO2	Calculate the cutting forces in orthogonal and oblique cutting
	CO3	Evaluate the machinability of materials
	CO4	Understand the abrasive processes
	CO5	Explain the different precision machining processes
	CO6	Understanding plastic mfg processes
Energy Conservation and Management	CO1	Students will be able to Understand energy problem and need of energy management
	CO2	Students will be able to Carry out energy audit of simple units
	CO3	Students will be able to Study various financial appraisal methods
	CO4	Students will be able to Analyze cogeneration and waste heat recovery systems
	CO5	Students will be able to Do simple calculations regarding thermal insulation and electrical energy conservation
Intellectual property rights	CO1	State the basic fundamental terms such as copyrights, Patents, Trademarks etc.,
	CO2	Interpret Laws of copy-rights, Patents, Trademarks and various IP registration Processes.
	CO3	Exhibit the enhance capability to do economic analysis of IP rights, technology and innovation related policy issues and firms commercial strategies.
	CO4	Create awareness at all levels (research and innovation) to develop patentable technologies.
	CO5	Apply trade mark law, copy right law, patent law and also carry out intellectual property Audits
	CO6	Manage and safeguard the intellectual property and protect it against unauthorized use
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	CO1	Understand the historical development of management theories and apply fundamental principles of planning and organizing to real-world scenarios.

Industrial Engineering and Management	CO2	Design and implement human resource management strategies that enhance organizational performance and employee satisfaction.
	CO3	"Analyze various production and operations management systems and apply them to enhance corporate profitability and competitiveness."
	CO4	Design and optimize operational systems for maximum efficiency and effectiveness.
	CO5	Analyze the historical development of industrial engineering and apply key principles to improve workplace efficiency.
	CO6	Apply ergonomic principles to design safer and more efficient work environments.
Mechatronics	CO1	Students will be able to explain working of various sensors used in mechatronics systems and their applications in engineering.
	CO2	Students will be able to explain signal conditioning & data representation techniques
	CO3	Students will able to design pneumatic and hydraulic circuits for a given application
	CO4	Students will be able to write a PLC program using ladder logic for a given application
	CO5	Students will be able to apply block diagram reduction techniques in order to find a transfer function for a given system using.
	CO6	Students will be able to solve problems related to control systems by using the analytical skills.
Entrepreneurship development	CO1	Enlarge the supply of entrepreneurs for rapid industrial development
	CO2	Develop small and medium enterprises sector which is necessary for generation of employment
	CO3	Industrialize rural and backward regions
	CO4	Provide gainful self-employment to educated young men and women
	CO5	Diversify the sources of entrepreneurship.
Non -conventional machining	CO1	Classify non-conventional machining processes
	CO2	Understand working principle and mechanism of material removal in various nonconventional machining processes
	CO3	Identify process parameters their effect and applications of different processes.
	CO4	Summarized merits and demerits of non-conventional machining processes
	CO5	Summarized merits and demerits of non-conventional machining processes