



ZEAL EDUCATION SOCIETY'S
ZEAL COLLEGE OF ENGINEERING AND RESEARCH
NARHE | PUNE -41 | INDIA
DEPARTMENT OF MECHANICAL ENGINEERING



Mechanical Engineering Department

Course Outcomes (COs)

S.E. Mechanical Engineering (2015 Course)

Course Code: C207002	
Name of Course: Engineering Mathematics – III	
C202.1	Apply the knowledge of higher order linear differential equations to model and analyze the mass spring systems.
C202.2	Understand the concepts of Laplace transform and Fourier transform and apply it to solve the models of vibration theory, heat transfer.
C202.3	Interpret and analyze the data using statistical tools and probability techniques.
C202.4	Apply the knowledge of vector calculus to analyze the vector fields occurred in fluid flow problems.
C202.5	Understand and Apply Vector Integral Calculus to Analyze Fluid Mechanics problems
C202.6	Understand the solutions of Partial differential equations and analyze the problems related to vibration of string and heat flow.

Course Code: C202041	
Name of Course: Manufacturing Process-I	
C201.1	Understand and Analyze pattern making, mold making, Core making and Inspection of defects
C201.2	Understand and analyze Hot and Cold Working, Rolling, Forging, Extrusion and Drawing Processes.
C201.3	Describe plastic molding processes, Extrusion of Plastic and Thermoforming
C201.4	Describe welding and joining processes and its defects
C201.5	Design and Analyze sheet metal working processes
C201.6	Describe Centre Lathe and Evaluate its process parameters



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Course Code: C202042	
Name of Course: Computer Aided Machine Drawing	
C202.1	Illustrate the importance of CAD in the light of allied technologies CAM, CAE, FEA, CFD, PLM.
C202.2	Apply parametric technology and its application in 2D sketching.
C202.3	Create solid model of a machine component using parametric technology
C202.4	Create 3D assemblies for static or dynamic Mechanical Systems
C202.5	Apply Geometric Dimensioning and Tolerancing for production drawings of the parts and assembly
C202.6	Create production drawings of the parts and assembly with appropriate tolerancing

Course Code: C202043	
Name of Course: Thermodynamics	
C203.1	Apply the laws of thermodynamics to flow and nonflow processes
C203.2	Apply the concept of Entropy and the gas laws for thermodynamic processes
C203.3	Evaluate the performance of Thermodynamic gas power cycles and gas refrigeration cycle and estimate availability of non-flow and steady flow systems
C203.4	Illustrate the condition of steam and evaluate the performance of vapour power cycle and vapour compression cycle.
C203.5	Estimate Stoichiometric air required for combustion, performance of steam generators and natural draught requirements in boiler plants.
C203.6	Estimate the essential properties related to Psychrometry processes



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Course Code: C202044	
Name of Course: Material Science	
C204.1	Compare crystal structures and Estimate lattice parameters
C204.2	Explain defects in Crystal structure and deformation theories of Metal & Materials.
C204.3	Evaluate mechanical properties using destructive and non-destructive testing of materials
C204.4	Explain Metals Corrosion & Its Prevention techniques
C204.5	Explain Surface Modification Methods
C204.6	Describe Powder Metallurgical Technology and state its applications.

Course Code: C202051	
Name of Course: Strength of Materials	
C201.1	Explain types of loads, Stress-strain diagram for ductile and brittle materials and Determine stresses and strains
C201.2	Draw Shear force and bending moment diagram for transverse loadings and supports.
C201.3	Compute the bending stresses and shear on a beam.
C201.4	Compute the slope & deflection on a beam and strain energy due to axial load, bending and torsion.
C201.5	Calculate torsional shear stress in shaft and buckling on the column.
C201.6	Apply the concept of principal stresses and theories of failure to determine stresses on a 2-D element.



Course Code: C202045	
Name of Course: Fluid Mechanics	
C205.1	Illustrate the fluid properties and APPLY the laws of fluid statics for the surfaces immersed in the fluid and understand the concept of buoyancy
C205.2	Evaluate terms associated in fluid kinematics
C205.3	APPLY principles of fluid dynamics for flow measurement
C205.4	Analyze the Velocity and shear Stress distribution for flow in plates and Identify hydro dynamically boundaries and Velocity profile.
C205.5	Estimate the friction and measure the frictional losses in fluid flow
C205.6	Analyze the forces drag and lift on immersed bodies and understand boundary layer formation for flow over Flat plate.

Course Code: C202048	
Name of Course: Theory of Machines – I	
C208.1	APPLY kinematic analysis to simple mechanisms
C208.2	ANALYZE the static and dynamic analysis of mechanisms of Slider Crank Mechanism
C208.3	Explain the fundamentals of design of Friction Clutches, Brakes and Dynamometer
C208.4	Analyze velocity and acceleration in mechanisms by Analytical method
C208.5	ANALYZE the velocity and acceleration in simple mechanisms by graphical methods
C208.6	ANALYZE the velocity and acceleration in mechanisms by graphical methods



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Course Code: C202049	
Name of Course: Engineering Metallurgy	
C209.1	Explain fundamentals of metal extraction, solidification and Equilibrium Diagram.
C209.2	Describe metal observations and Examine surface morphology using Microscopic and Macroscopy Techniques
C209.3	Describe cast iron, Iron-Carbon Diagram and cooling of steels
C209.4	Describe Austenite transformation in steel and Apply heat treatment processes and Surface Hardening methods to steels
C209.5	Describe Engineering Alloy Steels & its Designation
C209.6	Describe and select appropriate Non-Ferrous Materials for industrial applications

Course Code: C202050	
Name of Course: Applied Thermodynamics	
C2050.1	Demonstrate various Engines types and designs and Compare Air standard cycle with Actual cycle.
C2050.2	Describe the types of Carburetors and Illustrate combustion phenomenon in SI Engine
C2050.3	Describe the components of Fuel Supply system and Illustrate combustion phenomenon in CI Engine
C2050.4	Analyze the performance parameters for I.C. Engine
C2050.5	Describe the I C Engine systems and Acquire knowledge about the effect of IC engine emissions on environment and various emission control methods.
C2050.6	Explain the construction and working reciprocating and rotary air compressors and evaluate the performance of reciprocating compressors.



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Course Code: C203152	
Name of Course: Electrical and Electronics Engineering	
C203152.1	To learn basics of Arduino, its overview, programming concepts, working principal of DC motor and Induction motor, brief history of Electric Vehicle along with storage devices and drives used for it.
C203152.2	To apply programming concepts of Atmega328 based Arduino for interfacing of LED, LCD, and temperature sensor (LM35), LVDT, strain gauge with Arduino.
C203152.3	To understand constructional features, speed control methods, characteristics of DC Machines and three phase Induction Motor along with its applications in electrical and mechanical field.
C203152.4	To discuss components, types, benefits, subsystem, configuration of Electrical Vehicle technology
C203152.5	To select different Energy Storage device for EVs which includes Lithium- Iron Phosphate (LFP), Lithium Nickel-Manganese-Cobalt (NMC) and Lithium- Manganese Oxide (LMO) and to priorities drives used in EVs such as BLDC motor, three phase induction motor drive.

Course Code: C202053	
Name of Course: Machine Shop – I	
C203.1	Create a spur gear using milling machine
C203.2	Apply grinding process for surface machining
C203.3	Create sheet metal component using forming process
C203.4	Create plastic component using manufacturing process

Course Code: C202047	
Name of Course: Soft Skills	
C207.1	Understand and Evaluate Individual SWOT Analysis
C207.2	Demonstrate communication, listening and writing skills
C207.3	Develop multi-disciplinary skills through group discussion
C207.4	Create and publish video documentary through team work