



TSSM's
Padmabhooshan Vasantdada Patil Institute of Technology, Bavdhan, Pune-21

Course Outcome

Department of Mechanical Engineering:

Semester –I

CO of the Course “Strength of Material”

- CO1 Apply knowledge of mathematics, science for engineering applications
- CO2 Design and conduct experiments, as well as to analyze and interpret data
- CO3 Design a component to meet desired needs within realistic constraints of health and Safety
- CO4 Identify, formulates, and solves engineering problems
- CO5 Practice professional and ethical responsibility
- CO6 Use the techniques, skills, and modern engineering tools necessary for engineering Practice

CO of the Course “Material Science”

- CO1 Explain the mechanism of plastic deformation
- CO2 Understand the basic concepts and properties of Material, material fundamental and processing.
- CO3 Define the mechanical properties of materials and conduct destructive and nondestructive tests to evaluate and test the properties of materials
- CO4 Select proper metal, alloys, nonmetal and powder metallurgical component for specific requirement
- CO5 Detect the defects in crystal and its effect on crystal properties.
Evaluate the different properties of material by studying different test
- CO6 Recognize how metals can be strengthened by cold-working and hot working
- CO7 Draw and explain equilibrium diagrams for various alloy systems
- CO8 Understand various strengthening mechanisms
- CO9 Describe various pyrometers with a neat sketch and explain their working



Course Outcome

and application

- CO10 Understand corrosion and suggest various means to prevent corrosion
- CO11 Explain various aspects of powder metallurgy

CO of the Course “Engineering Thermodynamics”

- CO1 Apply various laws of thermodynamics to various processes and real systems.
- CO2 Apply the concept of Entropy, Calculate heat, work and other important thermodynamic properties for various ideal gas processes
- CO3 Estimate performance of various Thermodynamic gas power cycles and gas refrigeration cycle and availability in each case.
- CO4 Estimate the condition of steam and performance of vapour power cycle and vapour compression cycle.
- CO5 Estimate Stoichiometric air required for combustion, performance of steam generators and natural draught requirements in boiler plants.
- CO6 Use Psychrometric charts and estimate various essential properties related to Psychrometry and processes

CO of the Course “Manufacturing Process-I”

- CO1 Understand and analyze foundry practices like pattern making, mold making, Core making and Inspection of defects.
- CO2 Understand and analyze Hot and Cold Working, Rolling, Forging, Extrusion and Drawing Processes.
- CO3 Understand different plastic molding processes, Extrusion of Plastic and Thermoforming
- CO4 Understand different Welding and joining processes and its defects
- CO5 Understand, Design and Analyze different sheet metal working processes
- CO6 Understand the constructional details and Working of Centre Lathe



Course Outcome

CO of the Course “Theory of Machine-II”

- CO1 Explain spur gear theory which will be prerequisite for gear design.
- CO2 Find center distance, virtual no. of teeth, efficiency, tooth force, torque transmitted by helical, bevel, worm & worm gear.
- CO3 Find torque transmitting capacity in gear trains which will be the prerequisite for gearbox design
- CO4 Compare cam profile for different follower motion
- CO5 Explain synthesis of the mechanism.
- CO6 Explain Step less regulation and mechanism for system control - Gyroscope

CO of the Course “Metrology and Quality Control”

- CO 1 Understand the methods of measurement, selection of measuring instruments / standards of measurement, carryout data collection and its analysis.
- CO 2 Explain tolerance, limits of size, fits, geometric and position tolerances and gauge design
- CO 3 Understand and use/apply Quality Control Techniques/ Statistical Tools appropriately
- CO 4 Develop an ability of problem solving and decision making by identifying and analyzing the cause for variation and recommend suitable corrective actions for quality improvement.

CO of the Course “Heat Transfer”

- CO 1 Analyze the various modes of heat transfer and implement the basic heat conduction equations for steady one dimensional thermal system.
- CO 2 Implement the general heat conduction equation to thermal systems with and without internal heat generation and transient heat conduction.
- CO 3 Analyze the heat transfer rate in natural and forced convection and evaluate through experimentation investigation.



Course Outcome

- CO 4 Interpret heat transfer by radiation between objects with simple geometries.
- CO 5 Analyze the heat transfer equipment and investigate the performance.

CO of the Course “Design of Machine Element-II”

- CO 1 Ability to analyze the stress-strain, of Machine Elements to understand, identify, quantify the failure modes.
- CO 2 Ability to Design Power Screw for Various Applications.
- CO 3 Ability to design fasteners and welded joints subjected to different loading conditions.
- CO 4 Ability to design various Springs for strength and stiffness.
- CO 5 Select standard data and components by using Design Data Books, Codes and Standards for avoiding failure of machine components.

CO of the Course “Turbo Machinery”

- CO1 Classify turbo machines along with its applications and discuss impulse momentum principle to evaluate performance parameters for flat, inclined plate, curved vane and series of vanes.
- CO2 Analyze impulse water turbine with design aspects, selection criteria, performance parameters and characteristics for its use in hydroelectric power plant
- CO3 Differentiate reaction water turbines, draft tube types, governing mechanism, with design aspects, selection criteria and determine performance parameters and characteristics
- CO4 Discuss steam nozzle, impulse, and reaction steam turbine with governing mechanism, selection criteria, losses and evaluate performance parameters for its use in thermal power plant.
- CO5 Classify rotodynamic, centrifugal pump, heads, cavitation, priming, along with multi staging, system resistance curve and evaluate performance with design aspects and selection criteria for household and industrial application.
- CO6 Distinguish centrifugal and axial flow compressor with flow processes, losses and discuss performance parameter and characteristics.



Course Outcome

CO of the Course “Dynamic of Machinery”

- CO1 Implement balancing technique to complete balancing of rotating & reciprocating masses in multi cylinder inline & radial engines.
- CO2 Express the fundamentals of vibrations and estimate natural frequencies for single DOF un-damped and damped free vibratory systems.
- CO3 Formulate analytical competency to judge the response to forced vibrations due to harmonic excitation, base excitation and excitation due to reciprocating and rotary unbalance
- CO4 Formulate mathematical model and estimate natural frequencies, mode shapes (Eigen values and Eigen vectors) for DOF undamped free longitudinal and transverse vibratory systems.
- CO5 Choose suitable vibration measuring instrument for industrial / real life applications and select suitable method for vibration control
- CO6 Interpret noise, its measurement and reduction techniques for industry and day to day life problems

CO of the Course “CAD/CAM and Automation”

- CO1 Discuss Concept of computer graphics and find the transformations for 2 dimensional elements.
- CO2 Explain Analytically different types of curves, surfaces and solids and modeling the same for 2D/3D conditions.
- CO3 Analyze conditional safety of given component using FEA.
- CO4 Select CNC machine and develop CNC Part program for given work piece.
- CO5 Explain the Rapid Prototyping as advancement in manufacturing and its relation with software's and CAD modeling.
- CO6 Explain industrial automation in view of Robotic system, CIM, CAPP.

CO of the Course “Operation Research”

- CO1 Illustrate the need to optimally utilize the resources in various types of industries



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- CO2 Apply and analyze mathematical optimization functions to various applications
- CO3 Demonstrate cost effective strategies in various applications in industry
- CO4 Analyze the Dynamic and integer programming and apply them for arriving at optimal decisions

CO of the Course “Refrigeration and Air Conditioning”

- CO1 Demonstrate the fundamental Principles of Thermodynamics and working principal of R.A.C. methods
- CO2 Analyze the performance of the different Refrigeration cycle using P-h chart & property table & select appropriate for application.
- CO3 Select the appropriate refrigerant with respect to properties, application & environmental issues by comparative study.
- CO4 Analyze & Design appropriate air-conditioning system for any application
- CO5 Illustrate and analyze the principles and working of various equipment & safety controls & select in RAC system
- CO6 Demonstrate duct system design methods by solving simple numerical.

CO of the Course “Energy Audit and Management”

- CO1 Carry out Energy Audit of the residence / society / college where they are studying
- CO2 Carry out electrical tariff calculation and accurately predict the electricity bill required for the installation.
- CO3 Suggest various methods to reduce energy consumption of the equipment / office / premises



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Course Outcome

CO of the Course “Advanced Manufacturing Process”

- CO 1 Selection of appropriate manufacturing process for advance components
- CO 2 Characterization of work pieces
- CO 3 Selection of appropriate measurement techniques in micromachining

CO of the Course “Product Design and Development”

- CO1 Design a sustainable product.
- CO2 Develop commercial Product
- CO3 Master in new techniques PLM and PDM