



Vishwabharati Academy's
COLLEGE OF ENGINEERING
Sarola Baddi, Jamkhed Road, AHMEDNAGAR-414201

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE OUTCOMES (CO's)

Semester III

202041: Solid Mechanics

- CO1. DEFINE various types of stresses and strain developed on determinate and indeterminate members.
- CO2. DRAW Shear force and bending moment diagram for various types of transverse loading and support.
- CO3. COMPUTE the slope & deflection, bending stresses and shear stresses on a beam.
- CO4. CALCULATE torsional shear stress in shaft and buckling on the column.
- CO5. APPLY the concept of principal stresses and theories of failure to determine stresses on a 2-D element.
- CO6. UTILIZE the concepts of SFD & BMD, torsion and principal stresses to solve combined loading application based problems

202042: Solid Modeling and Drafting

- CO1. UNDERSTAND basic concepts of CAD system, scope in Product Lifecycle Management
- CO2. UTILIZE knowledge of curves & surfacing features to create complex solid geometry
- CO3. CONSTRUCT solid models, assemblies using various modeling techniques & PERFORM mass property analysis, including creating and using a coordinate system
- CO4. APPLY geometric transformations to simple 2D geometries
- CO5. USE CAD model data for various CAD based engineering applications viz. production drawings, 3D printing, FEA, CFD, MBD, CAE, CAM, etc.
- CO6. USE PMI & MBD approach for communication

202043: Engineering Thermodynamics

- CO1. DESCRIBE the basics of thermodynamics with heat and work interactions.
- CO2. APPLY laws of thermodynamics to steady flow and non-flow processes.
- CO3. APPLY entropy, available and non-available energy for an Open and Closed System,
- CO4. DETERMINE the properties of steam and their effect on performance of vapor power cycle.
- CO5. ANALYSE the fuel combustion process and products of combustion.
- CO6. SELECT various instrumentations required for safe and efficient operation of steam generator.

202044: Engineering Materials and Metallurgy

- CO1. COMPARE crystal structures and ASSESS different lattice parameters.
- CO2. CORRELATE crystal structures and imperfections in crystals with mechanical behaviour of materials.
- CO3. DIFFERENTIATE and DETERMINE mechanical properties using destructive and non-destructive testing of materials.
- CO4. IDENTIFY & ESTIMATE different parameters of the system viz., phases, variables, component, grains, grain boundary, and degree of freedom. etc.
- CO5. ANALYSE effect of alloying element & heat treatment on properties of ferrous & nonferrous alloy.
- CO6. SELECT appropriate materials for various applications.

203156: Electrical and Electronics Engineering

- CO1. APPLY programming concepts to UNDERSTAND role of Microprocessor and Microcontroller in embedded systems
- CO2. DEVELOP interfacing of different types of sensors and other hardware devices with Atmega328 based Adriano Board
- CO3. UNDERSTAND the operation of DC motor, its speed control methods and braking
- CO4. DISTINGUISH between types of three phase induction motor and its characteristic features
- CO5. EXPLAIN about emerging technology of Electric Vehicle (EV) and its modular subsystems
- CO6. CHOOSE energy storage devices and electrical drives for EVs

202045: Geometric Dimensioning and Tolerancing Lab

- CO1. SELECT appropriate IS and ASME standards for drawing
- CO2. READ & ANALYSE variety of industrial drawings
- CO3. APPLY geometric and dimensional tolerance, surface finish symbols in drawing
- CO4. EVALUATE dimensional tolerance based on type of fit, etc.
- CO5. SELECT an appropriate manufacturing process using DFM, DFA, etc.

Semester IV

207002: Engineering Mathematics - III

- CO1. SOLVE higher order linear differential equations and its applications to model and analyze mass spring systems.
- CO2. APPLY Integral transform techniques such as Laplace transform and Fourier transform to solve differential equations involved in vibration theory, heat transfer and related mechanical engineering applications.
- CO3. APPLY Statistical methods like correlation, regression in analyzing and interpreting experimental data applicable to reliability engineering and probability theory in testing and quality control.
- CO4. PERFORM Vector differentiation & integration, analyze the vector fields and APPLY to fluid flow problems.
- CO5. SOLVE Partial differential equations such as wave equation, one and two dimensional heat flow equations

202047: Kinematics of Machinery

- CO1. APPLY kinematic analysis to simple mechanisms
- CO2. ANALYZE velocity and acceleration in mechanisms by vector and graphical method
- CO3. SYNTHESIZE a four bar mechanism with analytical and graphical methods
- CO4. APPLY fundamentals of gear theory as a prerequisite for gear design
- CO5. CONSTRUCT cam profile for given follower motion

202048: Applied Thermodynamics

- CO1. DETERMINE COP of refrigeration system and ANALYZE psychometric processes.
- CO2. DISCUSS basics of engine terminology, air standard, fuel air and actual cycles.
- CO3. IDENTIFY factors affecting the combustion performance of SI and CI engines.
- CO4. DETERMINE performance parameters of IC Engines and emission control.
- CO5. EXPLAIN working of various IC Engine systems and use of alternative fuels.
- CO6. CALCULATE performance of single and multi-stage reciprocating compressors and DISCUSS rotary positive displacement compressors

202049: Fluid Mechanics

- CO1. DETERMINE various properties of fluid
- CO2. APPLY the laws of fluid statics and concepts of buoyancy
- CO3. IDENTIFY types of fluid flow and terms associated in fluid kinematics
- CO4. APPLY principles of fluid dynamics to laminar flow
- CO5. ESTIMATE friction and minor losses in internal flows and DETERMINE boundary layer formation over an external surface
- CO6. CONSTRUCT mathematical correlation considering dimensionless parameters, also ABLE to predict the performance of prototype using model laws

202049: Manufacturing Processes

- CO1. SELECT appropriate molding, core making and melting practice and estimate pouring time, solidification rate and DESIGN riser size and location for sand casting process
- CO2. UNDERSTAND mechanism of metal forming techniques and CALCULATE load required for flat rolling
- CO3. DEMONSTRATE press working operations and APPLY the basic principles to DESIGN dies and tools for forming and shearing operations
- CO4. CLASSIFY and EXPLAIN different welding processes and EVALUATE welding characteristics
- CO5. DIFFERENTIATE thermoplastics and thermosetting and EXPLAIN polymer processing techniques
- CO6. UNDERSTAND the principle of manufacturing of fibre-reinforce composites and metal matrix composites

202051: Machine Shop

- CO1. PERFORM welding using TIG/ MIG/ Resistance/Gas welding technique
- CO2. MAKE Fiber-reinforced Composites by hand lay-up process or spray lay-up techniques
- CO3. PERFORM cylindrical/surface grinding operation and CALCULATE its machining time
- CO4. DETERMINE number of indexing movements required and acquire skills to PRODUCE a spur gear on a horizontal milling machine
- CO5. PREPARE industry visit report
- CO6. UNDERSTAND procedure of plastic processing

202052: Project Based Learning - II

- CO1. IDENTIFY the real-world problem (possibly of interdisciplinary nature) through a rigorous literature survey and formulate / set relevant aims and objectives.
- CO2. ANALYZE the results and arrive at valid conclusions.
- CO3. PROPOSE a suitable solution based on the fundamentals of mechanical engineering by possibly integration of previously acquired knowledge.
- CO4. CONTRIBUTE to society through proposed solutions by strictly following professional ethics and safety measures.
- CO5. USE of technology in proposed work and demonstrate learning in oral and written form.
- CO6. DEVELOP ability to work as an individual and as a team member.