



## Course Outcomes:

### SE– Sem I

#### **Subject1: Solid Mechanics(202041)**

At the end of this course, Students will be able to

- CO202041.1.** DEFINE various types of stresses and strain developed on determinate and indeterminate members.
- CO202041.2.** DRAW Shear force and bending moment diagram for various types of transverse loading and support.
- CO202041.3.** COMPUTE the slope & deflection, bending stresses and shear stresses on a beam.
- CO202041.4.** CALCULATE torsional shear stress in shaft and buckling on the column.
- CO202041.5.** APPLY the concept of principal stresses and theories of failure to determine stresses on a 2-D element.
- CO202041.6.** UTILIZE the concepts of SFD & BMD, torsion and principal stresses to solve combined loading application based problems.

#### **Subject2: Solid Modeling and Drafting (202042)**

At the end of this course, Students will be able to

- CO202042.1.** UNDERSTAND basic concepts of CAD system, need and scope in Product Lifecycle Management
- CO202042.2.** UTILIZE knowledge of curves and surfacing features and methods to create complex solid geometry
- CO202042.3.** CONSTRUCT solid models, assemblies using various modeling techniques & PERFORM mass property analysis, including creating and using a coordinate system
- CO202042.4.** APPLY geometric transformations to simple 2D geometries
- CO202042.5.** USE CAD model data for various CAD based engineering applications viz. production drawings, 3D printing, FEA, CFD, MBD, CAE, CAM, etc.
- CO202042.6.** USE PMI & MBD approach for communication

#### **Subject3: Engineering Thermodynamics (202043)**

At the end of this course, Students will be able to

- CO202043.1.** DESCRIBE the basics of thermodynamics with heat and work interactions.
- CO 202043.2.** APPLY laws of thermodynamics to steady flow and non-flow processes.
- CO 202043.3.** APPLY entropy, available and non available energy for an Open and Closed System,
- CO 202043.4.** DETERMINE the properties of steam and their effect on performance of vapour power cycle.
- CO 202043.5.** ANALYSE the fuel combustion process and products of combustion.
- CO 202043.6.** SELECT various instrumentations required for safe and efficient operation of steam generator.



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#### **Subject4: Engineering Materials and Metallurgy (202044)**

At the end of this course, Students will be able to

**CO202044.1.** DESCRIBE the basics of thermodynamics with heat and work interactions.

**CO202044.2.** APPLY laws of thermodynamics to steady flow and non-flow processes.

**CO202044.3.** APPLY entropy, available and non available energy for an Open and Closed System,

**CO202044.4.** DETERMINE the properties of steam and their effect on performance of vapour power cycle.

**CO202044.5.** ANALYSE the fuel combustion process and products of combustion.

**CO202044.6.** SELECT various instrumentations required for safe and efficient operation of steam generator.

#### **Subject5: Electrical and Electronics Engineering (203156)**

At the end of this course, Students will be able to

**CO203156.1.** DESCRIBE the basics of thermodynamics with heat and work interactions.

**CO203156.2.** APPLY laws of thermodynamics to steady flow and non-flow processes.

**CO203156.3.** APPLY entropy, available and non available energy for an Open and Closed System,

**CO203156.4.** DETERMINE the properties of steam and their effect on performance of vapour power cycle.

**CO203156.5.** ANALYSE the fuel combustion process and products of combustion.

**CO203156.6.** SELECT various instrumentations required for safe and efficient operation of steam generator.

#### **Subject6: Geometric Dimensioning and Tolerancing Lab (202045)**

At the end of this course, Students will be able to

**CO202045.1.** SELECT appropriate IS and ASME standards for drawing

**CO202045.2.** READ & ANALYSE variety of industrial drawings

**CO202045.3.** APPLY geometric and dimensional tolerance, surface finish symbols in drawing

**CO202045.4.** EVALUATE dimensional tolerance based on type of fit, etc.

**CO202045.5.** SELECT an appropriate manufacturing process using DFM, DFA, etc.



## **SE– SemII**

### **Subject 1: Engineering Mathematics - III (207002)**

At the end of this course, Students will be able to

- CO207002.1.** SOLVE higher order linear differential equations and its applications to model and analyze mass spring systems.
- CO207002.2.** 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.
- CO207002.3.** APPLY Statistical methods like correlation, regression in analyzing and interpreting experimental data applicable to reliability engineering and probability theory in testing and quality control
- CO207002.4.** PERFORM Vector differentiation & integration, analyze the vector fields and APPLY to fluid flow problems
- CO207002.5.** SOLVE Partial differential equations such as wave equation, one and two dimensional heat flow equations.

### **Subject 2: Kinematics of Machinery (202047)**

At the end of this course, Students will be able to

- CO202047.1.** APPLY kinematic analysis to simple mechanisms
- CO202047.2.** ANALYZE velocity and acceleration in mechanisms by vector and graphical method
- CO202047.3.** SYNTHESIZE a four bar mechanism with analytical and graphical methods
- CO202047.4.** APPLY fundamentals of gear theory as a prerequisite for gear design
- CO202047.5.** CONSTRUCT cam profile for given follower motion

### **Subject 3: Applied Thermodynamics (202048)**

At the end of this course, Students will be able to

- CO202048.1.** DETERMINE COP of refrigeration system and ANALYZE psychrometric processes.
- CO202048.2.** DISCUSS basics of engine terminology, air standard, fuel air and actual cycles.
- CO202048.3.** IDENTIFY factors affecting the combustion performance of SI and CI engines.
- CO202048.4.** DETERMINE performance parameters of IC Engines and emission control.
- CO202048.5.** EXPLAIN working of various IC Engine systems and use of alternative fuels.
- CO202048.6.** CALCULATE performance of single and multi stage reciprocating compressors and DISCUSS rotary positive displacement compressors

### **Subject 4: Fluid Mechanics (202049)**

At the end of this course, Students will be able to

- CO202049.1.** DETERMINE various properties of fluid
- CO202049.2.** APPLY the laws of fluid statics and concepts of buoyancy
- CO202049.3.** IDENTIFY types of fluid flow and terms associated in fluid kinematics
- CO202049.4.** APPLY principles of fluid dynamics to laminar flow
- CO202049.5.** ESTIMATE friction and minor losses in internal flows and DETERMINE boundary layer formation over an external surface
- CO202049.6.** CONSTRUCT mathematical correlation considering dimensionless parameters, also ABLE to predict the performance of prototype using model laws



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### **Subject 5: Manufacturing Processes (202050)**

At the end of this course, Students will be able to

**CO202050.1.** SELECT appropriate moulding, core making and melting practice and estimate pouring time, solidification rate and DESIGN riser size and location for sand casting process

**CO202050.2.** UNDERSTAND mechanism of metal forming techniques and CALCULATE load required for flat rolling

**CO202050.3.** DEMONSTRATE press working operations and APPLY the basic principles to DESIGN dies and tools for forming and shearing operations

**CO202050.4.** CLASSIFY and EXPLAIN different welding processes and EVALUATE welding characteristics

**CO202050.5.** DIFFERENTIATE thermoplastics and thermosetting and EXPLAIN polymer processing techniques

**CO202050.6.** UNDERSTAND the principle of manufacturing of fibre-reinforced composites and metal matrix composites

### **Subject 6: Machine Shop (202051)**

At the end of this course, Students will be able to

**CO202051.1.** PERFORM welding using TIG/ MIG/ Resistance/Gas welding technique

**CO202051.2.** MAKE Fibre-reinforced Composites by hand lay-up process or spray lay-up techniques

**CO202051.3.** PERFORM cylindrical/surface grinding operation and CALCULATE its machining time

**CO202051.4.** DETERMINE number of indexing movements required and acquire skills to PRODUCE a spur gear on a horizontal milling machine

**CO202051.5.** PREPARE industry visit report

**CO202051.6.** UNDERSTAND procedure of plastic processing

### **Subject 7: Project Based Learning – II (202052)**

At the end of this course, Students will be able to

**CO202052.1.** IDENTIFY the real-world problem (possibly of interdisciplinary nature) through a rigorous literature survey and formulate / set relevant aims and objectives.

**CO202052.2.** ANALYZE the results and arrive at valid conclusions.

**CO202052.3.** PROPOSE a suitable solution based on the fundamentals of mechanical engineering by possibly integration of previously acquired knowledge.

**CO202052.4.** CONTRIBUTE to society through proposed solutions by strictly following professional ethics and safety measures.

**CO202052.5.** USE of technology in proposed work and demonstrate learning in oral and written form.

**CO202052.6.** DEVELOP ability to work as an individual and as a team member.