

Shree Mahavir Education Society's  
**Sanghavi College of Engineering, Nashik**  
**Department of Mechanical Engineering**  
**Course Outcomes**

**Second Year (2019 Pattern) : Semester-I**

<b>Course code</b>	<b>Course Name</b>	<b>Course Outcomes(Cos)</b>
202041	Solid Mechanics	<p>CO1. DEFINE various types of stresses and strain developed on determinate and indeterminate members.</p> <p>CO2. DRAW Shear force and bending moment diagram for various types of transverse loading and support.</p> <p>CO3. COMPUTE the slope &amp; deflection, bending stresses and shear stresses on a beam.</p> <p>CO4. CALCULATE torsional shear stress in shaft and buckling on the column.</p> <p>CO5. APPLY the concept of principal stresses and theories of failure to determine stresses on a 2-D element.</p> <p>CO6. UTILIZE the concepts of SFD &amp; BMD, torsion and principal stresses to solve combined loading application based problems.</p>
202042	Solid Modeling and Drafting	<p>CO1. UNDERSTAND basic concepts of CAD system, need and scope in Product Lifecycle Management</p> <p>CO2. UTILIZE knowledge of curves and surfacing features and methods to create complex solid geometry</p> <p>CO3. CONSTRUCT solid models, assemblies using various modeling techniques &amp; PERFORM mass property analysis, including creating and using a coordinate system</p> <p>CO4. APPLY geometric transformations to simple 2D geometries</p> <p>CO5. USE CAD model data for various CAD based engineering applications viz. production drawings, 3D printing, FEA, CFD, MBD, CAE, CAM, etc.</p> <p>CO6. USE PMI &amp; MBD approach for communication</p>
202043	Engineering Thermodynamics	<p>CO1. DESCRIBE the basics of thermodynamics with heat and work interactions.</p> <p>CO2. APPLY laws of thermodynamics to steady flow and non-flow processes.</p> <p>CO3. APPLY entropy, available and non available energy for an Open and Closed System,</p> <p>CO4. DETERMINE the properties of steam and their effect on performance of vapour power cycle.</p>

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202043	Engineering Thermodynamics	CO5. ANALYSE the fuel combustion process and products of combustion. CO6. SELECT various instrumentations required for safe and
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 Arduino 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.
<b>Second Year (2019 Pattern) : Semester-II</b>		
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

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207002	Engineering Mathematics - III	<p>engineering applications.</p> <p>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.</p> <p>CO4. PERFORM Vector differentiation &amp; integration, analyze the vector fields and APPLY to fluid flow problems.</p> <p>CO5. SOLVE Partial differential equations such as wave equation, one and two dimensional heat flow equations.</p>
202047	Kinematics of Machinery	<p>CO1. APPLY kinematic analysis to simple mechanisms</p> <p>CO2. ANALYZE velocity and acceleration in mechanisms by vector and graphical method</p> <p>CO3. SYNTHESIZE a four bar mechanism with analytical and graphical methods</p> <p>CO4. APPLY fundamentals of gear theory as a prerequisite for gear design</p> <p>CO5. CONSTRUCT cam profile for given follower motion</p>
202048	Applied Thermodynamics	<p>CO1. DETERMINE COP of refrigeration system and ANALYZE psychrometric processes.</p> <p>CO2. DISCUSS basics of engine terminology, air standard, fuel air and actual cycles.</p> <p>CO3. IDENTIFY factors affecting the combustion performance of SI and CI engines.</p> <p>CO4. DETERMINE performance parameters of IC Engines and emission control.</p> <p>CO5. EXPLAIN working of various IC Engine systems and use of alternative fuels.</p> <p>CO6. CALCULATE performance of single and multi stage reciprocating compressors and DISCUSS rotary positive displacement compressors</p>
202049	Fluid Mechanics	<p>CO1. DETERMINE various properties of fluid</p> <p>CO2. APPLY the laws of fluid statics and concepts of buoyancy</p> <p>CO3. IDENTIFY types of fluid flow and terms associated in fluid kinematics</p> <p>CO4. APPLY principles of fluid dynamics to laminar flow</p> <p>CO5. ESTIMATE friction and minor losses in internal flows and DETERMINE boundary layer formation over an external surface</p> <p>CO6. CONSTRUCT mathematical correlation considering dimensionless parameters, also ABLE to predict the performance of prototype using model laws</p>
202050	Manufacturing Processes	<p>CO1. SELECT appropriate moulding, core making and melting practice and estimate pouring time, solidification rate and DESIGN riser size and location for sand casting process</p>

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202050	Manufacturing Processes	<p>CO2. UNDERSTAND mechanism of metal forming techniques and CALCULATE load required for flat rolling</p> <p>CO3. DEMONSTRATE press working operations and APPLY the basic principles to DESIGN dies and tools for forming and shearing operations</p> <p>CO4. CLASSIFY and EXPLAIN different welding processes and EVALUATE welding characteristics</p> <p>CO5. DIFFERENTIATE thermoplastics and thermosetting and EXPLAIN polymer processing techniques</p> <p>CO6. UNDERSTAND the principle of manufacturing of fibre-reinforce composites and metal matrix composites</p>
202051	Machine Shop	<p>CO1. PERFORM welding using TIG/ MIG/ Resistance/Gas welding technique</p> <p>CO2. MAKE Fibre-reinforced Composites by hand lay-up process or spray lay-up techniques</p> <p>CO3. PERFORM cylindrical/surface grinding operation and CALCULATE its machining time</p> <p>CO4. DETERMINE number of indexing movements required and acquire skills to PRODUCE a spur gear on a horizontal milling machine</p> <p>CO5. PREPARE industry visit report</p> <p>CO6. UNDERSTAND procedure of plastic processing</p>
202052	Project Based Learning - II	<p>CO1. IDENTIFY the real-world problem (possibly of interdisciplinary nature) through a rigorous literature survey and formulate / set relevant aims and objectives.</p> <p>CO2. ANALYZE the results and arrive at valid conclusions.</p> <p>CO3. PROPOSE a suitable solution based on the fundamentals of mechanical engineering by possibly integration of previously acquired knowledge.</p> <p>CO4. CONTRIBUTE to society through proposed solutions by strictly following professional ethics and safety measures.</p> <p>CO5. USE of technology in proposed work and demonstrate learning in oral and written form.</p> <p>CO6. DEVELOP ability to work as an individual and as a team member</p>