

**Shanmuganathan Engineering College**

**(Approved by AICTE, Affiliated by  
Anna University Chennai)**

**Department  
Of  
Mechanical Engineering**

**Regulation-2017**

**Course Outcomes**

Semester -1	
Course code and Name	Course Outcomes (CO) After Completion of the course, the students will be to
GE8152 - Engineering Graphics	CO1: Familiarize with the fundamentals and standards of Engineering graphics CO2: Perform freehand sketching of basic geometrical constructions and multiple views of objects. CO3: Project orthographic projections of lines and plane surfaces CO4: Draw projections and solids and development of surfaces CO5: Visualize and to project isometric and perspective sections of simple solids

Semester -2	
Course code and Name	Course Outcomes (CO) After Completion of the course, the students will be to
GE8292 - Engineering Mechanics	CO1: Illustrate the vectorial and scalar representation of forces and moments CO2: Analyse the rigid body in equilibrium CO3: Evaluate the properties of surfaces and solids CO4: Calculate dynamic forces exerted in rigid body CO5: Determine the friction and the effects by the laws of friction

Semester -3	
Course code and Name	Course Outcomes (CO) After Completion of the course, the students will be to
GE8292 - Engineering Mechanics	<p>CO1: Illustrate the vectorial and scalar representation of forces and moments</p> <p>CO2: Analyse the rigid body in equilibrium</p> <p>CO3: Evaluate the properties of surfaces and solids</p> <p>CO4: Calculate dynamic forces exerted in rigid body</p> <p>CO5: Determine the friction and the effects by the laws of friction</p>
ME8391 -Engineering Thermodynamics	<p>CO1: Apply the first law of thermodynamics for simple open and closed systems under steady and unsteady conditions.</p> <p>CO2 : Apply second law of thermodynamics to open and closed systems and calculate entropy and availability.</p> <p>CO3: Apply Rankine cycle to steam power plant and compare few cycle improvement methods</p> <p>CO4: Derive simple thermodynamic relations of ideal and real gases</p> <p>CO5: Calculate the properties of gas mixtures and moist air and its use in psychometric processes</p>
CE8394 - Fluid Mechanics And Machinery	<p>CO1: Apply mathematical knowledge to predict the properties and characteristics of a fluid.</p> <p>CO2:Can analyse and calculate major and minor losses associated with pipe flow in piping networks.</p> <p>CO3: Can mathematically predict the nature of physical quantities</p> <p>CO4:Can critically analyse the performance of pumps</p> <p>CO5: Can critically analyse the performance of turbines.</p>

Semester -3

<b>Course code and Name</b>	<b>Course Outcomes (CO)</b> <b>After Completion of the course, the students will be to</b>
ME8351 - Manufacturing Technology – I	CO1 : Explain different metal casting processes, associated defects, merits and demerits CO2 :Compare different metal joining processes. CO3: Summarize various hot working and cold working methods of metals. CO4: Explain various sheet metal making processes. CO5:Distinguish various methods of manufacturing plastic components.
GE8292 - Engineering Mechanics	CO1: Illustrate the vectorial and scalar representation of forces and moments CO2: Analyse the rigid body in equilibrium CO3: Evaluate the properties of surfaces and solids CO4: Calculate dynamic forces exerted in rigid body CO5: Determine the friction and the effects by the laws of friction

Semester -4

Course code and Name	Course Outcomes (CO) After Completion of the course, the students will be to
ME8492 - Kinematics Of Machinery	<p>CO1 : Discuss the basics of mechanism</p> <p>CO2: Calculate velocity and acceleration in simple mechanisms</p> <p>CO3:Develop CAM profiles</p> <p>CO4: Solve problems on gears and gear trains</p> <p>CO5:Examine friction in machine elements</p>
ME8451 - Manufacturing Technology – II	<p>CO1: Explain the mechanism of material removal processes.</p> <p>CO2: Describe the constructional and operational features of centre lathe and other special purpose lathes.</p> <p>CO3: Describe the constructional and operational features of shaper, planner, milling, drilling, sawing and broaching machines.</p> <p>CO4: Explain the types of grinding and other super finishing processes apart from gear manufacturing processes.</p> <p>CO5:Summarize numerical control of machine tools and write a part program</p>
ME8491 - Engineering Metallurgy	<p>CO1: Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification.</p> <p>CO2 : Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes.</p> <p>CO3: Clarify the effect of alloying elements on ferrous and non-ferrous metals</p> <p>CO4: Summarize the properties and applications of non metallic materials.</p> <p>CO5: Explain the testing of mechanical properties.</p>

<p>CE8495 - Strength Of Materials For Mechanical Engineers</p>	<p>CO1: Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes.</p> <p>CO2: Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment.</p> <p>CO3: Apply basic equation of simple torsion in designing of shafts and helical spring</p> <p>CO4: Calculate the slope and deflection in beams using different methods.</p> <p>CO5: Analyze and design thin and thick shells for the applied internal and external pressures.</p>
<p>ME8493 - Thermal Engineering - I</p>	<p>CO1: Apply thermodynamic concepts to different air standard cycles and solve problems.</p> <p>CO2: Solve problems in single stage and multistage air compressors</p> <p>CO3: Explain the functioning and features of IC engines, components and auxiliaries.</p> <p>CO4 : Calculate performance parameters of IC Engines.</p> <p>CO5: Explain the flow in Gas turbines and solve problems.</p>

Semester -5

Course code and Name	Course Outcomes (CO) After Completion of the course, the students will be to
ME8595 - Thermal Engineering – II	<p>CO1: Solve problems in Steam Nozzle</p> <p>CO2 : Explain the functioning and features of different types of Boilers and auxiliaries and calculate performance parameters.</p> <p>CO3: Explain the flow in steam turbines, draw velocity diagrams for steam turbines and solve problems.</p> <p>CO4: Summarize the concept of Cogeneration, Working features of Heat pumps and Heat exchangers</p> <p>CO5: Solve problems using refrigerant table / charts and psychrometric charts</p>
ME8593 - Design Of Machine Elements	<p>CO1: Explain the influence of steady and variable stresses in machine component design.</p> <p>CO2: Apply the concepts of design to shafts, keys and couplings.</p> <p>CO3: Apply the concepts of design to temporary and permanent joints.</p> <p>CO4: Apply the concepts of design to energy absorbing members, connecting rod and crank shaft.</p> <p>CO5: Apply the concepts of design to bearings</p>
ME8501 - Metrology And Measurements	<p>CO1: Describe the concepts of measurements to apply in various metrological instruments</p> <p>CO2 : Outline the principles of linear and angular measurement tools used for industrial applications</p> <p>CO3 : Explain the procedure for conducting computer aided inspection</p> <p>CO4: Demonstrate the techniques of form measurement used for industrial components</p> <p>CO5: Discuss various measuring techniques of mechanical properties in industrial applications</p>

ME8594 -  
Dynamics Of Machines

CO1: Calculate static and dynamic forces of mechanisms.

CO2: Calculate the balancing masses and their locations of reciprocating and rotating masses.

CO3: Compute the frequency of free vibration.

CO4: Compute the frequency of forced vibration and damping coefficient.

CO5 : Calculate the speed and lift of the governor and estimate the gyroscopic effect on automobiles, ships and airplanes.

Semester -6

Course code and Name	Course Outcomes (CO) After Completion of the course, the students will be to
ME8651 Design Of Transmission Systems	<p>CO1: Apply the concepts of design to belts, chains and rope drives.</p> <p>CO2: Apply the concepts of design to spur, helical gears.</p> <p>CO3 :Apply the concepts of design to worm and bevel gears.</p> <p>CO4:Apply the concepts of design to gear boxes .</p> <p>CO5 :Apply the concepts of design to cams, brakes and clutches</p>
ME8691 - Computer Aided Design And Manufacturing	<p>CO1 : Explain the 2D and 3D transformations, clipping algorithm, Manufacturing models and Metrics</p> <p>CO2: Explain the fundamentals of parametric curves, surfaces and Solids</p> <p>CO3 : Summarize the different types of Standard systems used in CAD</p> <p>CO4: Apply NC &amp; CNC programming concepts to develop part programme for Lathe &amp; Milling Machines</p> <p>CO5 : Summarize the different types of techniques used in Cellular Manufacturing and FMS</p>
ME8693- Heat And Mass Transfer	<p>CO1: Apply heat conduction equations to different surface configurations under steady state and transient conditions and solve problems</p> <p>CO2: Apply free and forced convective heat transfer correlations to internal and external flows through/over various surface configurations and solve problems</p> <p>CO3: Explain the phenomena of boiling and condensation, apply LMTD and NTU methods of thermal analysis to different types of heat exchanger configurations and solve problems</p> <p>CO4: Explain basic laws for Radiation and apply these principles to radiative heat transfer between different types of surfaces to solve problems</p>

<p>ME8692 - Finite Element Analysis</p>	<p>CO1: Summarize the basics of finite element formulation.</p> <p>CO2: Apply finite element formulations to solve one dimensional Problems.</p> <p>CO3: Apply finite element formulations to solve two dimensional scalar Problems.</p> <p>CO4 : Apply finite element method to solve two dimensional Vector problems.</p> <p>CO5 : Apply finite element method to solve problems on iso parametric element and dynamic Problems</p>
<p>ME8694 - Hydraulics And Pneumatics</p>	<p>CO1: Explain the Fluid power and operation of different types of pumps.</p> <p>CO2 : Summarize the features and functions of Hydraulic motors, actuators and Flow control valves</p> <p>CO3: Explain the different types of Hydraulic circuits and systems</p> <p>CO4: Explain the working of different pneumatic circuits and systems</p> <p>CO5: Summarize the various trouble shooting methods and applications of hydraulic and pneumatic systems.</p>

Semester -7

Course code and Name	Course Outcomes (CO) After Completion of the course, the students will be to
ME8792 - Power Plant Engineering	<p>CO1: Explain the layout, construction and working of the components inside a thermal power plant.</p> <p>CO2 : Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants.</p> <p>CO3 : Explain the layout, construction and working of the components inside nuclear power plants.</p> <p>CO4: Explain the layout, construction and working of the components inside Renewable energy power plants.</p> <p>CO5: Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.</p>
ME8793 - Process Planning And Cost Estimation	<p>CO1:select the process, equipment and tools for various industrial products.</p> <p>CO2 : Prepare process planning activity chart.</p> <p>CO3:Explain the concept of cost estimation.</p> <p>CO4: compute the job order cost for different type of shop floor.</p> <p>CO5 :calculate the machining time for various machining operations.</p>
ME8791 - MECHATRONICS	<p>CO1: Discuss the interdisciplinary applications of Electronics, Electrical, Mechanical and Computer Systems for the Control of Mechanical, Electronic Systems and sensor technology.</p> <p>CO2: Discuss the architecture of Microprocessor and Microcontroller, Pin Diagram, Addressing Modes of Microprocessor and Microcontroller.</p> <p>CO3: Discuss Programmable Peripheral Interface, Architecture of 8255 PPI, and various device interfacing</p> <p>CO4: Explain the architecture, programming and application of programmable logic controllers to problems and challenges in the areas of Mechatronic engineering.</p>

Semester -8

<b>Course code and Name</b>	<b>Course Outcomes (CO)</b> <b>After Completion of the course, the students will be to</b>
MG8591 - Principles Of Management	CO1: Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management