KARPAGAM INSTITUTE OF TECHNOLOGY

COIMBATORE – 641 105

B.E. MECHANICAL ENGINEERING
COURSE OUTCOMES

Course Code / Course Name:GE8152 / Engineering Graphics

CO No	Course Outcomes (COs)
C106.1	Construct the conic curves, involutes, cycloid and perform freehand sketching of basic geometrical constructions with multiple views of objects.
C106.2	Develop a projection of points, lines and plane surfaces.
C106.3	Develop a projection of simple solids.
C106.4	Develop a projection of sectioned solids and development of surfaces.
C106.5	Developan isometric and perspective projection of simple solids.

Course Code / Course Name: GE8292/ Engineering Mechanics

CO No.	Course Outcomes (COs)
C114.1	Identify the vector and scalar representation of forces and moments.
C114.2	Solve the rigid body in equilibrium.
C114.3	Utilize the properties of distributed forces.
C114.4	Build dynamic forces exerted in rigid body.
C114.5	Develop the friction and the effects by the laws of friction.

Course Code / Course Name: GE8261 / Engineering Practices Laboratory

CO No	Course Outcomes (COs)
C115.1	Construct the pipeline connections to household fittings and industrial buildings.
C115.2	Develop different joints in roofs, doors, windows and furniture.
C115.3	Make use of welding equipments to join the structures.
C115.4	Utilize lathe and drilling machines to perform basic machining operations.
C115.5	Construct a funnel and tray using sheet metal operation and demonstration on smithy, foundry and fitting operations.

Course Code / Course Name: ME8391 / Engineering Thermodynamics

CO No.	Course Outcomes (COs)
C202.1	Apply the zeroth and first law of thermodynamics by formulating temperature scales and calculating the property changes in closed and open engineering systems.
C202.2	Apply the second law of thermodynamics in analysing the performance of thermal devices through energy and entropy calculations.
C202.3	Apply the second law of thermodynamics in evaluating the various properties of steam through steam tables and Mollier chart.
C202.4	Apply the properties of pure substance in computing the macroscopic properties of ideal and real gases using gas laws and appropriate thermodynamic relations.
C202.5	Apply the properties of gas mixtures in calculating the properties of gas mixtures and applying various thermodynamic relations to calculate property changes.

Course Code / Course Name: CE 8394 / Fluid Mechanics and Machinery

CO No.	Course Outcomes (COs)
C203.1	Apply mathematical knowledge to predict the properties and characteristics of a fluid.
C203.2	Solve major and minor losses associated with pipe flow in piping networks.
C203.3	Apply mathematically predict the nature of physical quantities.
C203.4	Identify and evaluate the performance of pumps.
C203.5	Identify and evaluate the performance of turbines.

Course Code / Course Name: ME8351 / Manufacturing Technology I

CO No.	Course Outcomes (COs)
C204.1	Explain different metal casting processes, associated defects, merits and demerits.
C204.2	Compare different metal joining processes.
C204.3	Summarize various hot working and cold working methods of metals.
C204.4	Explain various sheet metal making processes.
C204.5	Distinguish various methods of manufacturing plastic components.

Course Code / Course Name: ME8361 / Manufacturing Technology - I Laboratory

CO No.	Course Outcomes (COs)
C206.1	Demonstrate the safety precautions exercised in the mechanical workshop.
C206.2	Model the work piece as per given shape and size using.
C206.3	Demonstrate the joining of two metals using arc welding.
C206.4	Make use of sheet metal fabrication tools and make simple tray and funnel.
C206.5	Make use of different moulding tools, patterns and prepare sand moulds.

Course Code / Course Name: ME8381 / Computer Aided Machine Drawing

CO No	Course Outcomes (COs)
C207.1	Summarize the basic concepts of machine drawing and define the code of practice for engineering drawing.
C207.2	Explain the various types of fits and tolerances.
C207.3	Develop a 2D drawing of bearings and valves.
C207.4	Develop a 2D drawing of couplings and joints.
C207.5	Develop a 2D drawing of engine parts and machine components.

Course Code / Course Name: ME8492 / Kinematics of Machinery

CO No.	Course Outcomes (COs)
C211.1	Explain the basics of kinematic mechanism.
C211.2	Construct the velocity and acceleration diagram for simple mechanisms.
C211.3	Develop CAM profiles.
C211.4	Solve problems on gears and gear trains.
C211.5	Experiment with friction in machine elements.

Course Code / Course Name: ME8451 / Manufacturing Technology II

CO No.	Course Outcomes (COs)
C212.1	Outline the mechanism of material removal processes.
C212.2	Explain the constructional and operational features of centre lathe and other special purpose lathes.
C212.3	Describe the constructional and operational features of shaper, planner, milling, drilling, sawing and broaching machines.
C212.4	Explain the types of grinding and other super finishing processes apart from gear manufacturing processes.
C212.5	Summarize numerical control of machine tools and write a part program.

Course Code / Course Name: ME8491 / Engineering Metallurgy

CO No.	Course Outcomes (COs)
C213.1	Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification.
C213.2	Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes.
C213.3	Classify the effect of alloying elements on ferrous and non-ferrous metals.
C213.4	Summarize the properties and applications of non-metallic materials.
C213.5	Explain the testing of mechanical properties.

Course Code / Course Name: CE 8395 / Strength of Materials for Mechanical Engineers

CO No.	Course Outcomes (COs)
C214.1	Understand and develop the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes.
C214.2	Understand and identify the load transferring mechanism in beams and stress distribution due to shearing force and bending moment.
C214.3	Apply basic equation of simple torsion in designing of shafts and helical spring
C214.4	Solve the slope and deflection in beams using different methods.
C214.5	Apply and design thin and thick shells for the applied internal and external pressures.

Course Code / Course Name: ME8493 / Thermal Engineering I

CO No.	Course Outcomes (COs)
C215.1	Apply thermodynamic concepts to different air standard cycles and solve problems.
C215.2	Solve problems in single stage and multistage air compressors.
C215.3	Explain the functioning and features of IC engines, components and auxiliaries.
C215.4	Identify the performance parameters of IC Engines.
C215.5	Explain the flow in Gas turbines and solve problems.

Course Code / Course Name: ME8462 / Manufacturing Technology - II Laboratory

CO No.	Course Outcomes (COs)
C216.1	Make use of different machine tools to cut gears.
C216.2	Make use of different machine tools to generate gears.
C216.3	Make use of different machine tools for finishing operations.
C216.4	Construct tools using cutter grinder
C216.5	Develop CNC part programming

Course Code / Course Name: CE8381/Strength of Materials and Fluid mechanics Laboratory

CO No.	Course Outcomes (COs)
C217.1	Experiment with the Performance of Tension and Torsion test on Solid materials.
C217.2	Experiment with the Performance of Compression test, Hardness test, on Solid materials.
C217.3	Identify the Performance of Deformation test on Solid materials.
C217.4	Utilize the measurement equipments for flow measurement.
C217.5	Experiment with the Performance test on different fluid machinery.

Course Code / Course Name: ME 8595/ Thermal Engineering II

CO No.	Course Outcomes (COs)
C301.1	Solve problems in Steam Nozzle.
C301.2	Explain the functioning and features of different types of Boilers and auxiliaries and calculate performance parameters.
C301.3	Identify the flow in steam turbines, draw velocity diagrams for steam turbines and solve problems.
C301.4	Develop the concept of Cogeneration, Working features of Heat pumps and Heat exchangers.
C301.5	Solve problems using refrigerant table / charts and psychrometric charts.

Course Code / Course Name: ME8593 / Design of Machine Elements

CO No.	Course Outcomes (COs)
C302.1	Apply the influence of steady and variable stresses in machine component design.
C302.2	Apply the design concepts of shafts, keys and couplings.
C302.3	Apply the design concepts of temporary and permanent joints.
C302.4	Apply the design concepts of energy absorbing members, connecting rod and crank shaft.
C302.5	Apply the design concepts of bearings.

Course Code / Course Name: ME8501 / Metrology and Measurements

CO No.	Course Outcomes (COs)
C303.1	Illustrate the concepts of measurements to apply in various metrological instruments.
C303.2	Outline the principles of linear and angular measurement tools used for industrial applications.
C303.3	Explain the procedure for conducting computer aided inspection.
C303.4	Demonstrate the techniques of form measurement used for industrial components.
C303.5	Summarize various measuring techniques of mechanical properties in industrial applications.

Course Code / Course Name: ME8594 / Dynamics of Machines

CO No.	Course Outcomes (COs)
C304.1	Utilize static and dynamic forces of mechanisms.
C304.2	Make use of the balancing masses and their locations of reciprocating and rotating masses.
C304.3	Solve the frequency of free vibration.
C304.4	Solve the frequency of forced vibration and damping coefficient.
C304.5	Experiment with the speed and lift of the governor and estimate the gyroscopic effect on automobiles, ships and airplanes.

Course Code / Course Name: ORO551 / Renewable Energy Sources

CO No.	Course Outcomes (COs)
C305.1	Outline the physics of solar radiation.
C305.2	Classify the principles and operations of solar energy collectors.
C305.3	Summarize the different methods and applications of solar energy storage.
C305.4	Explain the types of wind energy conversion system and biomass energy with its economic aspects.
C305.5	Compare the methods of harnessing geothermal energy.

Course Code / Course Name: ME8511 / Kinematics and Dynamics Laboratory

CO No.	Course Outcomes (COs)
C306.1	Apply gear parameters & its velocity ratio and experiment with basic kinematics mechanism such as four bar, slider crank, crank rocker, double crank, double rocker, oscillating cylinder mechanisms and universal joints.
C306.2	Experiment with mass moment of inertia of Fly wheel, axisymmetric bodies & bifilar suspension and understand the effect of gyroscopic couple.
C306.3	Apply range sensitivity, effort for Watt, Porter, Proell, and Hartnell governors and develop the cam profile with jump speed phenomenon.
C306.4	Experiment with longitudinal and transverse vibrations in a system.
C306.5	Experiment with torsional vibration in a system & balancing of rotating and reciprocating masses.

Course Code / Course Name: ME8512 / Thermal Engineering Laboratory

CO No.	Course Outcomes (COs)
307.1	Experiment with the tests on heat conduction apparatus and evaluate thermal conductivity of materials.
307.2	Experiment with the tests on natural and forced convective heat transfer apparatus and evaluate heat transfer coefficient.
307.3	Identify and conduct the tests on radiative heat transfer apparatus and evaluate Stefan Boltzmann constant and emissivity.
307.4	Apply the tests to evaluate the performance of parallel/counter flow heat exchanger apparatus and reciprocating air compressor.
307.5	Experiment with the tests and evaluate the performance of refrigeration and air conditioning test rigs.

Course Code / Course Name: ME8513 / Metrology and Measurements Laboratory

CO No.	Course Outcomes (COs)
C308.1	Calibrate the vernier, micrometer and slip gauges and setting up the comparator for the inspection.
C308.2	Measure the thread parameters, temperature using thermocouple, force, displacement, torque and vibration.
C308.3	Measure the gear tooth dimensions, angle using sine bar, straightness and flatness, Surface Finish.
C308.4	Construct the torque characteristic curves to loads at various distances.
C308.5	Measure the conducting computer aided inspection.

Course Code / Course Name: ME8651 / Design of Transmission Systems

CO No.	Course Outcomes (COs)
C309.1	Make use of the concepts of design of belts, chains and rope drives.
C309.2	Solve problems on design of spur, helical gears.
C309.3	Utilize the design concepts of worm and bevel gears.
C309.4	Apply the concepts of design of gear boxes.
C309.5	Solve problems on design of cams, brakes and clutches.

Course Code / Course Name: ME8691 / Computer Aided Design and Manufacturing

CO No.	Course Outcomes (COs)
C310.1	Summarize the 2D and 3D transformations, clipping algorithm, manufacturing models and metrics.
C310.2	Outline the fundamentals of parametric curves, surfaces and solids.
C310.3	Compare the different types of standard systems used in CAD.
C310.4	Develop NC & CNC part programming for Lathe & Milling Machining operations.
C310.5	Explain the different types of techniques used in Cellular Manufacturing and FMS.

Course Code / Course Name: ME8693 / Heat and Mass transfer

CO No.	Course Outcomes (COs)
C311.1	Apply heat conduction equations to different surface configurations under steady state and transient conditions and solve problems.
C311.2	Apply free and forced convective heat transfer correlations to internal and external flows through/over various surface configurations and solve problems.
C311.3	Develop the phenomena of boiling and condensation, apply LMTD and NTU methods of thermal analysis to different types of heat exchanger configurations and solve problems.
C311.4	Develop basic laws for Radiation and apply these principles to radiative heat transfer between different types of surfaces to solve problems.
C311.5	Apply diffusive and convective mass transfer equations and correlations to solve problems for different applications.

Course Code / Course Name: ME8692 /Finite Element Analysis

CO No.	Course Outcomes (COs)
C312.1	Explain the basics of finite element formulation.
C312.2	Apply finite element formulations to solve one dimensional Problems.
C312.3	Make use of finite element formulations to solve two dimensional scalar Problems.
C312.4	Solve finite element method of two dimensional Vector problems.
C312.5	Build the FEM to solve problems on Iso-parametric element and dynamic Problems.

Course Code / Course Name: ME8694/Hydraulics and Pneumatics

CO No.	Course Outcomes (COs)
C313.1	Explain the Fluid power and operation of different types of pumps.
C313.2	Summarize the features and functions of hydraulic motors, actuators and flow control valves.
C313.3	Construct the different types of Hydraulic circuits and systems.
C313.4	Explain the working of different pneumatic circuits and systems.
C313.5	Summarize the various trouble shooting methods and applications of hydraulic and pneumatic systems.

Course Code / Course Name: ME8091 / Automobile Engineering

CO No.	Course Outcomes (COs)
C314.1	Summarize the various parts of the automobile and their functions and materials.
C314.2	Illustrate the engine auxiliary systems and engine emission control.
C3143	Compare the working of different types of transmission systems.
C314.4	Explain the Steering, Brakes and Suspension Systems.
C314.5	Relate the possible alternate sources of energy for IC Engines.

Course Code / Course Name: ME8681 / CAD / CAM Laboratory

CO No	Course Outcomes (COs)
C315.1	Explain and interpret machine manufacturing drawings.
C315.2	Develop 2D and 3D models using high end modeling software's
C315.3	Apply engineering drawing standards as per BIS conventions.
C315.4	Explain the CNC control in modern manufacturing system.
C315.5	Develop CNC part programming and perform manufacturing.

Course Code / Course Name: ME8682 / Design and Fabrication Project.

CO No.	Course Outcomes (COs)
C316.1	Identification of machine elements and mechanical components.
C316.2	Develop a 3D model of the designed product.
C316.3	Construct the machine element or the mechanical product.
C316.4	Make use of the working model of the machine element or the mechanical product.
C316.5	Develop the necessary documents and reports for the final fabricated product.

Course Code / Course Name: ME8792 / Power Plant Engineering

CO No.	Course Outcomes (COs)
C401.1	Explain the layout, construction and working of the components inside a thermal power plant.
C402.2	Demonstrate the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants.
C401.3	Explain the layout, construction and working of the components inside a nuclear power plant.
C401.4	Explain the layout, construction and working of the components inside a renewable energy power plant.
C401.5	Demonstrate the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.

Course Code / Course Name: ME8793 / Process Planning and Cost Estimation

CO No.	Course Outcomes (COs)
C402.1	Explain the process, equipment and tools for various industrial products.
C402.2	Illustrate an activity chart for process planning.
C402.3	Apply the ideas of cost estimate procedures.
C402.4	Identify the various cost components for the welding, forging, and casting processes.
C402.5	Solve the length of time required for various machining operations.

Course Code / Course Name: ME8791 / Mechatronics

CO No.	Course Outcomes (COs)
C403.1	Discuss the interdisciplinary applications of Electronics, Electrical, Mechanical and Computer Systems for the Control of Mechanical, Electronic Systems and sensor technology.
C403.2	Discuss the architecture of Microprocessor and Microcontroller, Pin Diagram, Addressing Modes of Microprocessor and Microcontroller.
C403.3	Discuss Programmable Peripheral Interface, Architecture of 8255 PPI, and various device interfacing.
C403.4	Explain the architecture, programming and application of programmable logic controllers to problems and challenges in the areas of Mechatronic engineering.
C403.5	Discuss various Actuators and Mechatronics system using the knowledge and skills acquired through the course and also from the given case studies.

Course Code / Course Name: OIE751 / Robotics

CO No.	Course Outcomes (COs)
C404.1	Explain the concepts of industrial robots, classification, specifications and coordinate systems. Also summarize the need and application of robots in different sectors.
C404.2	Illustrate the different types of robot drive systems as well as robot end effectors.
C404.3	Outline the different sensors and image processing techniques in robotics to improve the ability of robots.
C404.4	Demonstrate robotic programs for different tasks and familiarize with the kinematics motions of robot.
C404.5	Summarize the implementation of robots in various industrial sectors and interpolate the economic analysis of robots.

Course Code / Course Name: ME8073 / Unconventional Machining Processes

CO No.	Course Outcomes (COs)
C405.1	Explain the need for unconventional machining processes and its classification.
C405.2	Compare various thermal energy and electrical energy based unconventional machining processes.
C405.3	Summarize various chemical and electro-chemical energy based unconventional machining processes.
C405.4	Explain various nano abrasives based unconventional machining processes.
C405.5	Explain various recent trends in unconventional machining processes.

Course Code / Course Name: ME8097/ Non Destructive Testing and Evaluation

CO No.	Course Outcomes (COs)
C406.1	Explain the fundamental concepts of NDT.
C406.2	Explain the different methods of NDE.
C406.3	Explain the concept of Thermography and Eddy current testing.
C406.4	Explain the concept of Ultrasonic Testing and Acoustic Emission.
C406.5	Explain the concept of Radiography.

Course Code / Course Name: ME8711 / Simulation and Analysis Laboratory

CO No	Course Outcomes (COs)
C407.1	Construct the working principle of air conditioning system, hydraulic and pneumatic cylinder and cam follower mechanisms using MATLAB.
C407.2	Analyze the stresses, deflection and strains induced in trusses, cables, and beam with different support condition.
C407.3	Examine the different stress analysis on flat plates, simple shells and axi-symmetric components.
C407.4	Analyze the thermal stress and heat transfer analysis on plates and cylindrical shells.
C407.5	Examine the natural frequency and mode shape analysis of 2D components and beams.

Course Code / Course Name: ME8781 /Mechatronics Laboratory

CO No	Course Outcomes (COs)
C408.1	Demonstrate the functioning of mechatronics system with various pneumatic systems.
C408.2	Demonstrate the functioning of mechatronics system with various hydraulic systems.
C408.3	Demonstrate the functioning of mechatronics system with various electrical systems.
C408.4	Demonstrate the functioning of control systems with the help of PLC
C408.5	Demonstrate the functioning of control systems with the help of microcontrollers.

Course Code / Course Name: ME8712 /Technical Seminar

CO No	Course Outcomes (COs)
C409.1	Identify recent technical topics from interested domains.
C409.2	Analyze the applicability of modern software tools and technology.
C409.3	Identify Communication skills.
C409.4	Develop Presentation skills.
C409.5	Build Technical report preparation skills.

Course Code / Course Name: MG8591 / Principles of Management

CO No.	Course Outcomes (COs)
C410.1	Explain the various concepts in Management and its evolution's.
C410.2	Summarize the importance of Planning and Decision Making Process.
C410.3	Outline the organization role and human resource management.
C410.4	Illustrate about various Motivational techniques.
C410.5	Explain about various management tools.

Course Code / Course Name: MG8091 / Entrepreneurship Development

CO No.	Course Outcomes (COs)
C411.1	Summarize the basic fundamentals of Entrepreneur.
C411.2	Explain the entrepreneurship development programs and major motives influencing an entrepreneur.
C411.3	Explain small enterprises, project formulation and assessment.
C411.4	Outline the sources of finance and accounting, the management of working capital and taxation.
C411.5	Interpret the various supports available to entrepreneurs during sickness, government policy and growth strategies in small business.

Course Code / Course Name: ME8811 / Project work

CO No	Course Outcomes (COs)
C412.1	Identification of Problems from the existing research.
C412.2	Analyzethe impact of the problem and to make use of the relevant Literatures.
C412.3	Examine the proposed research and to develop a design and experimentation.
C412.4	Inspect the working model of the research.
C412.5	Develop the necessary documents and reports for the research.