KARPAGAM INSTITUTE OF TECHNOLOGY

COIMBATORE – 641 105.

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE OUTCOMES (REGULATION 2021)

INDEX

SEMESTER II

Course Code / Course Name:GE3251 / Engineering Graphics

CO No	Course Outcomes (COs)	Knowledge Level
C114.1	Construct the conic curves, involutes, cycloid and perform freehand sketching of basic geometrical constructions with multiple views of objects.	**K3**
C114.2	Develop a projection of points, lines and plane surfaces.	**K3**
C114.3	Develop a projection of simple solids.	**K3**
C114.4	Develop a projection of sectioned solids and development of surfaces.	**K3**
C114.5	Developan isometric and perspective projection of simple solids.	**K3**

Course Code / Course Name: GE3271/ Engineering Practices Laboratory

CO No	Course Outcomes (COs)	Knowledge Level
C117.1	Construct the pipeline connections to household fittings and industrial buildings.	**K3**
C117.2	Develop different joints in roofs, doors, windows and furniture.	**K3**
C117.3	Make use of welding equipments to join the structures.	**K3**
C117.4	Utilize lathe and drilling machines to perform basic machining operations.	**K3**
C117.5	Construct a funnel and tray using sheet metal operation and demonstration on smithy, foundry and fitting operations.	**K3**

SEMESTER III

Course Code / Course Name: ME3351/ Engineering Mechanics

CO No.	Course Outcomes (COs)	Knowledge Level
C202.1	Identify the vector and scalar representation of forces and moments.	K3
C202.2	Solve the rigid body in equilibrium.	K3
C202.3	Utilize the properties of distributed forces.	K3
C202.4	Build dynamic forces exerted in rigid body .	K3
C202.5	Develop the friction and the effects by the laws of friction.	K3

Course Code / Course Name: ME3391 / Engineering Thermodynamics

CO No.	Course Outcomes (COs)	Knowledge Level
C203.1	Apply the zeroth and first law of thermodynamics by formulating temperature scales and calculating the property changes in closed and open engineering systems.	K3
C203.2	Apply the second law of thermodynamics in analysing the performance of thermal devices through energy and entropy calculations.	K3
C203.3	Apply the second law of thermodynamics in evaluating the various properties of steam through steam tables and Mollier chart.	K3
C203.4	Apply the properties of pure substance in computing the macroscopic properties of ideal and real gases using gas laws and appropriate thermodynamic relations.	K3
C203.5	Apply the properties of gas mixtures in calculating the properties of gas mixtures and applying various thermodynamic relations to calculate property changes.	K3

Course Code / Course Name: CE 3391 / Fluid Mechanics and Machinery

CO No.	Course Outcomes (COs)	Knowledge Level
C204.1	Apply mathematical knowledge to predict the properties and characteristics of a fluid.	K3
C204.2	Solve major and minor losses associated with pipe flow in piping networks.	K3
C204.3	Apply mathematically predict the nature of physical quantities.	K3
C204.4	Identify and evaluate the performance of pumps.	K3
C204.5	Identify and evaluate the performance of turbines.	K3

Course Code / Course Name: ME3392 / Engineering Materials & Metallurgy

CO No.	Course Outcomes (COs)	Knowledge Level
C205.1	Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification.	K2
C205.2	Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes.	K2
C205.3	Classify the effect of alloying elements on ferrous and non-ferrous metals.	K2
C205.4	Summarize the properties and applications of non-metallic materials.	K2
C205.5	Explain the testing of mechanical properties.	K2

Course Code / Course Name: ME3393 / Manufacturing Processes

CO No.	Course Outcomes (COs)	Knowledge Level
C206.1	Explain different metal casting processes, associated defects, merits and demerits.	K2
C206.2	Compare different metal joining processes.	K2
C206.3	Summarize various hot working and cold working methods of metals.	K2
C206.4	Explain various sheet metal making processes.	K2
C206.5	Distinguish various methods of manufacturing plastic components.	K2

Course Code / Course Name: ME3381 / Computer Aided Machine Drawing

CO No	Course Outcomes (COs)	Knowledge Level
C207.1	Summarize the basic concepts of machine drawing and define the code of practice for engineering drawing.	**K2**
C207.2	Explain the various types of fits and tolerances.	**K2**
C207.3	Develop a 2D drawing of bearings and valves.	**K3**
C207.4	Develop a 2D drawing of couplings and joints.	**K3**
C207.5	Develop a 2D drawing of engine parts and machine components.	**K3**

Course Code / Course Name: ME3382/ Manufacturing Technology - I Laboratory

CO No.	Course Outcomes (COs)	Knowledge Level
C208.1	Demonstrate the safety precautions exercised in the mechanical workshop.	K2
C208.2	Model the work piece as per given shape and size using.	K2
C208.3	Demonstrate the joining of two metals using arc welding.	K2
C208.4	Make use of sheet metal fabrication tools and make simple tray and funnel.	K3
C208.5	Make use of different moulding tools, patterns and prepare sand moulds.	K3

SEMESTER IV

Course Code / Course Name: ME3491 / Therory of Machines

CO No.	Course Outcomes (COs)	Knowledge Level
C210.1	Explain the basics of mechanism.	K2
C210.2	Solve problems on gears and gear trains.	K3
C210.3	Examine friction in machine elements.	K3
C210.4	Calculate static and dynamic forces of mechanisms.	K3
C210.5	Calculate the balancing masses and their locations of reciprocating and rotating masses. Computing the frequency of free vibration, forced vibration and damping coefficient.	K3

Course Code / Course Name: ME3451 / Thermal Engineering

CO No.	Course Outcomes (COs)	Knowledge Level
C211.1	Apply thermodynamic concepts to different air standard cycles and solve problems.	K3
C211.2	Solve problems in Steam Nozzle.	K3
C211.3	Explain the flow in Gas turbines and solve problems steam turbines, draw velocity diagrams for steam turbines and solve problems.	K2
C211.4	Explain the functioning and features of IC engines, components and auxiliaries.	K3
C211.5	Identify the performance parameters of IC Engines.	K2

Course Code / Course Name: ME3492/Hydraulics and Pneumatics

CO No.	Course Outcomes (COs)	Knowledge Level
C212.1	Explain the Fluid power and operation of different types of pumps.	K2
C212.2	Summarize the features and functions of hydraulic motors, actuators and flow control valves.	K2
C212.3	Construct the different types of Hydraulic circuits and systems.	K2
C212.4	Explain the working of different pneumatic circuits and systems.	K2
C212.5	Summarize the various trouble shooting methods and applications of hydraulic and pneumatic systems.	K2

Course Code / Course Name: ME3493 / Manufacturing Technology

CO No.	Course Outcomes (COs)	Knowledge Level
C213.1	Outline the mechanism of material removal processes.	K2
C213.2	Explain the constructional and operational features of centre lathe and other special purpose lathes.	K2
C213.3	Describe the constructional and operational features of shaper, planner, milling, drilling, sawing and broaching machines.	K2
C213.4	Explain the types of grinding and other super finishing processes apart from gear manufacturing processes.	K2
C213.5	Summarize numerical control of machine tools and write a part program.	K2

Course Code / Course Name: CE 3491 / Strength of Materials

CO No.	Course Outcomes (COs)	Knowledge Level
C214.1	Understand and develop the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes.	K3
C214.2	Understand and identify the load transferring mechanism in beams and stress distribution due to shearing force and bending moment.	K3
C214.3	Apply basic equation of simple torsion in designing of shafts and helical spring	K3
C214.4	Solve the slope and deflection in beams using different methods.	K3
C214.5	Apply and design thin and thick shells for the applied internal and external pressures.	K3

Course Code / Course Name: CE3481/Strength of Materials and Fluid mechanics Laboratory

CO No.	Course Outcomes (COs)	Knowledge Level
217.1	Experiment with the Performance of Tension and Torsion test on Solid materials.	K3
217.2	Experiment with the Performance of Compression test, Hardness test, on Solid materials.	K3
217.3	Identify the Performance of Deformation test on Solid materials.	K3
217.4	Utilize the measurement equipments for flow measurement.	K3
217.5	Experiment with the Performance test on different fluid machinery.	K3

Course Code / Course Name: ME3461 / Thermal Engineering Laboratory

CO No.	Course Outcomes (COs)	Knowledge Level
307.1	Experiment with the tests on heat conduction apparatus and evaluate thermal conductivity of materials.	K3
307.2	Experiment with the tests on natural and forced convective heat transfer apparatus and evaluate heat transfer coefficient.	K3
307.3	Identify and conduct the tests on radiative heat transfer apparatus and evaluate Stefan Boltzmann constant and emissivity.	K3
307.4	Apply the tests to evaluate the performance of parallel/counter flow heat exchanger apparatus and reciprocating air compressor.	K3
307.5	Experiment with the tests and evaluate the performance of refrigeration and air conditioning test rigs.	K3

SEMESTER V

Course Code / Course Name: ME3591 / Design of Machine Elements

CO No.	Course Outcomes (COs)	Knowledge Level
C301.1	Apply the influence of steady and variable stresses in machine component design.	K3
C301.2	Apply the design concepts of shafts, keys and couplings.	K3
C301.3	Apply the design concepts of temporary and permanent joints.	K3
C301.4	Apply the design concepts of energy absorbing members, connecting rod and crank shaft.	K3
C301.5	Apply the design concepts of bearings.	K3

Course Code / Course Name: ME3592 / Metrology and Measurements

CO No.	Course Outcomes (COs)	Knowledge Level
C302.1	Illustrate the concepts of measurements to apply in various metrological instruments.	K2
C302.2	Outline the principles of linear and angular measurement tools used for industrial applications.	K2
C302.3	Explain the procedure for conducting computer aided inspection.	K2
C302.4	Demonstrate the techniques of form measurement used for industrial components.	K2
C302.5	Summarize various measuring techniques of mechanical properties in industrial applications.	K2

Course Code / Course Name: ME3581 / Metrology and Dynamics Laboratory

CO No.	Course Outcomes (COs)	Knowledge Level
C308.1	Measure the thread parameters, temperature using thermocouple, force, displacement, torque and vibration.	K3
C308.2	Measure the gear tooth dimensions, angle using sine bar, straightness and flatness, Surface Finish.	K3
C308.3	Apply range sensitivity, effort for Watt, Porter, Proell, and Hartnell governors and develop the cam profile with jump speed phenomenon.	K3
C308.4	Experiment with longitudinal and transverse vibrations in a system.	K3
C308.5	Experiment with torsional vibration in a system & balancing of rotating and reciprocating masses.	K3

SEMESTER VI

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

CO No.	Course Outcomes (COs)	Knowledge Level
C309.1	Apply heat conduction equations to different surface configurations under steady state and transient conditions and solve problems.	K3
C309.2	Apply free and forced convective heat transfer correlations to internal and external flows through/over various surface configurations and solve problems.	K3
C309.3	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.	K3
C309.4	Develop basic laws for Radiation and apply these principles to radiative heat transfer between different types of surfaces to solve problems.	K3
C309.5	Apply diffusive and convective mass transfer equations and correlations to solve problems for different applications.	K3

Course Code / Course Name: ME3681 / CAD / CAM Laboratory

CO No	Course Outcomes (COs)	Knowledge Level
C317.1	Explain and interpret machine manufacturing drawings.	**K2**
C317.2	Develop 2D and 3D models using high end modeling software's	**K3**
C317.3	Apply engineering drawing standards as per BIS conventions.	**K3**
C317.4	Explain the CNC control in modern manufacturing system.	**K2**
C317.5	Develop CNC part programming and perform manufacturing.	**K3**

Course Code / Course Name: ME3682 / Heat Transfer Laboratory

CO No.	Course Outcomes (COs)	Knowledge Level
C318.1	Experiment with the tests on heat conduction apparatus and evaluate thermal conductivity of materials.	K3
C318.2	Experiment with the tests on natural and forced convective heat transfer apparatus and evaluate heat transfer coefficient.	K3
C318.3	Identify and conduct the tests on radiative heat transfer apparatus and evaluate Stefan Boltzmann constant and emissivity.	K3
C318.4	Apply the tests to evaluate the performance of parallel/counter flow heat exchanger apparatus and reciprocating air compressor.	K3
C318.5	Experiment with the tests and evaluate the performance of refrigeration and air conditioning test rigs.	K3

SEMESTER VII

Course Code / Course Name: ME3791 / Mechatronics and IoT

CO No.	Course Outcomes (COs)	Knowledge Level
C401.1	Discuss the interdisciplinary applications of Electronics, Electrical, Mechanical and Computer Systems for the Control of Mechanical, Electronic Systems and sensor technology.	K2
C401.2	Discuss the architecture of Microprocessor and Microcontroller, Pin Diagram, Addressing Modes of Microprocessor and Microcontroller.	K2
C401.3	Discuss Programmable Peripheral Interface, Architecture of 8255 PPI, and various device interfacing.	K2
C401.4	Explain the architecture, programming and application of programmable logic controllers to problems and challenges in the areas of Mechatronic engineering.	K2
C401.5	Discuss various Actuators and Mechatronics system using the knowledge and skills acquired through the course and also from the given case studies.	K2

Course Code / Course Name: ME3792/ Computer Integrated Manufacturing

CO No.	Course Outcomes (COs)	Learning Level
C402.1	Explain the basic concepts of CAD, CAM and computer integrated manufacturing systems	**K2**
C402.2	Summarize the production planning and control and computerized process planning	**K2**
C402.3	Differentiate the different coding systems used in group technology	**K2**
C402.4	Explain the concepts of flexible manufacturing system (FMS) and automated guided vehicle (AGV) system	**K2**
C402.5	Classification of robots used in industrial applications	**K2**

Course Code / Course Name: ME3781 / Mechatronics and IoT Laboratory

CO No	Course Outcomes (COs)	Knowledge Level
C408.1	Demonstrate the functioning of mechatronics system with various pneumatic systems.	K3
C408.2	Demonstrate the functioning of mechatronics system with various hydraulic systems.	K3
C408.3	Demonstrate the functioning of mechatronics system with various electrical systems.	K3
C408.4	Demonstrate the functioning of control systems with the help of PLC	K3
C408.5	Demonstrate the functioning of control systems with the help of microcontrollers.	K3