LORDS INSTITUTE OF ENGINEERING & TECHNOLOGY

Hyderabad-500091, TS.

Department of Mechanical Engineering

Course Outcomes (COs)

A.Y:2023-24   **Year: II-I- Sem**

Student will be able to

Course Outcomes: C211- Mathematics-III (PDE, PROBABILITY & STATISTICS) (U21MA301)

CO. No.	Description
C211.1	Solve field problems in engineering involving first order PDEs.
C211.2	Solve field problems in engineering involving higher order PDEs.
C211.3	Apply the concepts of probability, distributions and it moments, kurtosis and skewness
C211.4	Determine the coefficient of correlation, regression and obtain the knowledge of sampling theory with context to test of hypothesis.
C211.5	Analyze and check the validity of statement using testing of hypothesis for various parameters and goodness of fit.

Course Outcomes: C212 – Engineering Mechanics (U21ME301)

CO. No.	Description
C212.1	Apply the principles of equilibrium to solve the problems involving diagram concurrent and non-concurrent force system and to develop the ability to create accurate free body diagram
C212.2	Apply the methods to analyze the forces and reactions in trusses considering both internal and external forces.
C212.3	Determine the forces induced in different members of truss by the method of joints and section.
C212.4	Determine the centroid, Area moment of inertia, product of inertia and mass moment of inertia of different geometric cross section
C212.5	Explain kinematics & kinetics of particles, projectiles, curvilinear motion, centroidal motion and plane motion of rigid bodies
C212.6	Apply the knowledge of Principle of virtual work to extract the information regarding hidden and unknown variables in a system.

Course Outcomes: C213– English for Technical Communication (U21EN301)

CO. No.	Description
C213.1	Acquire and apply technical communication professionally
C213.2	Correspond technically through various methods and style of technical writing
C213.3	Apply different types of business correspondence in various situations
C213.4	Gain and apply different technical writing skills of report writing
C213.5	Obtain efficient skills in creating and designing technical manuals

Course Outcomes: C214 – Manufacturing Processes (U21ME302)

CO. No.	Description
C214.1	Design the patterns, and identify the types of allowances of patterns used in casting.
C214.2	Create new gating system in special metal casting processes including new Designs.
C214.3	Classify the different welding processes with respect to specification and execution, in traditional processes in Manufacturing Industries.
C214.4	Categorize different types of Solid-state welding theory that emphasizes the metals that spontaneously weld to each other that includes Resistance welding, Friction welding, Diffusion, Explosion, and Ultrasonic Welding.
C214.5	Perform basic metal forming processes like extrusion, rolling, forging, wire drawing and sheet metal working process.
C214.6	Differentiate NDT techniques by selecting suitable manufacturing processes to manufacture the products optimally.

Course Outcomes: C215 – Thermodynamics (U21ME303)

CO. No.	Description
C215.1	Understand the basic definitions in thermodynamics, zeroth law of thermodynamics & apply principles of thermometry.
C215.2	Understand interaction between heat and work, state first law of thermodynamics and analyze of first law of thermodynamics to open system and closed system.
C215.3	Prove the equivalence of two statements of second law of thermodynamics and apply them to refrigerators, heat engines, heat pumps.
C215.4	Understand the concept of entropy, available and unavailable energies analyze and apply for control volume.
C215.5	Describe the properties of pure substances, gases and their mixtures, and apply the property relations to thermodynamic problems.
C215.6	Compare and Analyze the Power Cycle, Vapour Cycles and Refrigeration Cycles.

Course Outcomes: C216 – Advanced Communication Skills Lab (U21EN3L1)

CO. No.	Description
C216.1	Organize ideas relevantly and coherently in their communication
C216.2	Analyze and comprehend the text inferentially
C216.3	Write Resume/CV and Cover letter effectively
C216.4	Practice oral presentation confidently
C216.5	Participate in group discussions dynamically
C216.6	Face interviews optimistically

Course outcomes: C217 – Manufacturing Processes Lab (U21ME3L1)

CO. No.	Description
C217.1	Explain the properties of moulding sands and pattern making.
C217.2	Understand fabrication of joints using gas welding and arc welding & evaluate the quality of welded joints.
C217.3	Identify the basic idea of press working tools and performs moulding studies on plastics.
C217.4	Demonstrate the understanding of the theoretical concepts of above technologies while working in small groups.
C217.5	Identity the defects / imperfections and discuss their causes and suggest remedies to eliminate them.

Course outcomes: C218 – Machine Drawing and Modelling Lab (U21ME3L2)

CO. No.	Description
C218.1	Draw isometric views of various mechanical components.
C218.2	Draw Orthogonal projections and sectional views of various mechanical components.
C218.3	Draw free hand sketches of various mechanical components
C218.4	Understand the shape and structure of different types of joints, screws, keys and Couplings.
C218.5	Use both the software and drafter to produce assembly views of various mechanical components from part drawings.

Course outcomes: C219 – Programming Language I (U21CS3L1)

CO. No.	Description
C219.1	Write, test, and debug simple Python programs.
C219.2	Implement Python programs with conditionals and loops.
C219.3	Develop Python programs step-wise by defining functions and calling them.
C219.4	Use Python lists, tuples, dictionaries for representing compound data.
C219.5	Read and write data from/to files in Python

Course Outcomes (COs)

Student will be able to

Course outcomes: C311 – Mechanics of Fluids and Hydraulic Machinery (U21ME501)

CO. No.	Description
C311.1	Identify the various fluid properties and pressure measurement techniques for determining the behavior of the fluids at static and in motion.
C311.2	Explain the type of fluid flow patterns and describe continuity equation, and apply fundamental laws of fluid mechanics and the Bernoulli's principle for analyzing practical applications.
C311.3	Apply appropriate equations and principles to analyze problems and losses in pipe flows.
C311.4	Interpret and apply performance laws to turbomachines (Impact of jet on vanes) of different types.
C311.5	Demonstrate the working principles of various hydraulic turbines and estimate their performances.
C311.6	Estimate performance parameters of a given Centrifugal and Reciprocating pump.

Course outcomes: C312 – Dynamics of Machines (U21ME502)

CO. No.	Description
C312.1	Analyze static and dynamic forces in slider crank and other mechanisms; determine the magnitude ofgyroscopic couple and its effect on vehicles in motion
C312.2	Evaluate the performance of various types of governors and design flywheels considering speed andenergy fluctuation.
C312.3	Determine frictional torque in clutches and understand the working of brakes and dynamometers.
C312.4	Analyze problems of balancing in rotating and reciprocating machinery.
C312.5	Evaluate the natural frequencies of single and two degree of freedom systems in free and forcedvibration mode, also considering the effect of damping

Course outcomes: C313 – Design of Machine Elements-I (U21ME503)

CO. No.	Description
C313.1	Demonstrate the basic design procedure and design of components subjected to combined normal and shear stresses and criteria of failure theory.
C313.2	Design the different shaped machine elements subjected to fatigue loading of simplest normal and stresses and will demonstrate the different methods to reduce the stress concentration.
C313.3	Analyze the different ways in which a shaft can be loaded and the suitable best suited method to design the shaft which can withstand the given complex loads
C313.4	Map out and design the different types ok shaft keys and Couplings used in different industrial applications
C313.5	Apply the knowledge of different welded and riveted joints for design and manufacturing of different components of a machine
C315.6	Illustrate the design, development and use of knuckle joint, spigot cotter joint, gib and cotter joint, strap end of a connecting rod and use of different keyways in engineering applications.

Course outcomes: C314 – Disaster preparedness and management (U21CE509)

CO. No.	Description
C314.1	Learn about the basic principles of disaster management and the types of disasters
C314.2	Understand the disaster management cycle and framework.
C314.3	Know about the disaster management systems in India and the applications of the latest technologies in disaster management
C314.4	Understand about the different types of disasters.
C314.5	Know about the past disasters occurred across the globe.

Course outcomes: C315 –Renewable Energy Resources (U21ME507)

CO. No.	Description
C315.1	Summarize the renewable and non-renewable sources of energy
C315.2	Acquire the knowledge of various components, principle of operation and present scenario ofdifferent conventional and non-conventional sources.
C315.3	Explain the use of solar energy and the various components used in the energy production withrespect to applications
C315.4	Design wind turbine blades and know about applications of wind energy for water pumping andelectricity generation
C315.5	Relate the concept of Biomass energy resources and their classification, types of biogas Plants- applications and summarize the knowledge of Ocean energy, tidal energy, and geothermal

Course outcomes: C316 – Mechanics of Fluids and Hydraulic Machinery Lab (U21ME5L1)

CO. No.	Description
C316.1	Practice and experiment on different types of turbines.
C316.2	Analyze the performance of turbines at rated and off design conditions.
C316.3	Investigate through experimentation different types of pump models and estimate their performance.
C316.4	Apply the principle of different flow measuring instruments and their adoptability to the industry.
C316.5	Develop the hydraulic circuits to cater the needs of the industry.

Course outcomes: C317 – Dynamics of Machines Lab (U21ME5L2)

CO. No.	Description
C317.1	Estimate the Gyroscopic couple and its effect on a Precessing rotating member.
C317.2	Evaluate performance characteristics of centrifugal governors.
C317.3	Determine the magnitude, location and orientation of a balancing mass required to balance theunbalance rotating system and verify the static and dynamic balancing.
C317.4	Analyze the cam profile for motion characteristics.
C317.5	Determine the time period and natural frequencies of simple and compound pendulum.

Course outcomes: C318 – Java Programming Lab (U21CS5L3)

CO. No.	Description
C318.1	Develop java application using the concept of Inheritance, Interface, packages, access control specifies
C318.2	Implement the concept of Exception Handling I Java Application
C318.3	Read and Write data using different Java I/O stream
C318.4	Create graphical user interfaces ad Applets by applying the knowledge of Event Handling
C318.5	Create roust application using Java standard class libraries and retrieve data from database with JDBC

Course outcomes: C319 – Internship (U21ME5P1)

CO. No.	Description
C319.1	Design/develop a small and simple product in hardware or software.
C319.2	Complete the task or realize a pre specified target, with limited scope, rather than taking up acomplex task and leave it.
C319.3	Learn to find alternate viable solutions for a given problem.
C319.4	Evaluate these alternatives with reference to pre specified criteria.
C319.5	Implement the selected solution and document the same.

Course Outcomes (COs)

A.Y:2023-24   **Year: IV-I- Sem.**

Student will be able to

Course Name: C411 Operations Research (HS104ME)

CO. No.	Description
C411.1	Interpret the concepts, scope and phases of operations research. Apply the L.P.P and derive optimal solutions to linear programming problems by graphical method, simplex method, and Big-M method.
C411.2	Construct Dual model and apply the dual Simplex Method
C411.3	Construct the Transportation and Assignment model and determine optimum solutions for transportation, Assignment and travelling salesman problems.
C411.4	Assess a game theory for pure and mixed strategy under competitive environment. Estimate the replacement time for deteriorate items when value of money is counted & not counted.
C411.5	Determine the minimum processing times for sequencing of n-jobs-2/3/m & 2-jobs-n machines and
C411.6	Evaluate the waiting line problems for M/M/1 and M/M/K queuing models and illustrate various optimization techniques

Course Name: C412 Automation in Manufacturing (PC416ME)

CO. No.	Description
C412.1	Explain the importance of automation in field of machine tool-based manufacturing.
C412.2	Interpret the concepts in CAD and Numerical control machines.
C412.3	Explain the concepts of CAM.
C412.4	Construct the codes for CNC machining.
C412.5	Explain the Additive Manufacturing Technologies.
C412.6	Apply the concepts of Pneumatics & hydraulics system and controls in manufacturing and FMS

Course Name: C413 Refrigeration & Air Conditioning (PE543ME)

CO. No.	Description
C413.1	Understand various natural and artificial methods of refrigeration, importance of refrigerant selection and the environmental issues related to the use of CFCs.
C413.2	Explain different types of refrigerants used in vapour compression refrigeration system and single or multi stage system based on operating temperature range.
C413.3	Apply the principles of vapour absorption, thermoelectric and steam-jet refrigeration systems. Select a suitable refrigerant absorbent mixture for Vapour absorption refrigeration system.
C413.4	Analyze various problems on psychrometric processes, know the construction and application of Psychrometric chart.
C413.5	Analyze air conditioning system based on given inside and outside conditions also cooling and heating loads in an air conditioning system.
C413.6	Evaluate typical conditions required for various food product processes and applications of refrigeration and air conditioning.

Course Name: C414 3D Printing Technology (PE541ME)

CO. No.	Description
C414.1	Interpret the fundamental concepts of 3D Printing, its advantages and limitations.
C414.2	Recognize liquid-based RP Systems
C414.3	Recognize different types of Powder based RP System and Rapid Tooling.
C414.4	Identify the various types of STL file errors and other data formats used in 3D Printing Technology
C414.5	Illustrate the diversified applications of 3D Printing Technologies.
C414.6	Explain the working principle, advantages, disadvantages and applications of liquid, solid and Powder based 3D Printing Technologies

Course Name: C415 Total Quality Management (PE553ME)

CO. No.	Description
C415.1	Understanding of the process of managing quality and managing services.
C415.2	Choose appropriate statistical techniques for improving processes;
C415.3	Develop research skills that will allow them to keep abreast of changes in the field of Total Quality Management
C415.4	Provide a valuable perspective for future business managers.
C415.5	Explain the various types of Techniques are used to measure Quality.
C415.6	Apply various Quality Systems and Auditing on implementation of TQM.

Course Name: C416 Non-Conventional Energy Sources (OE603EE)

CO. No.	Description
C416.1	Understand various unconventional sources and power generation methods for generating electricity.
C416.2	Comprehend the growth of solar electricity and its various applications.
C416.3	Classify the various techniques used to generate wind energy.
C416.4	Identify the various applications of wind energy and the environmental effects associated with wind power installations.
C416.5	Understand the fundamentals of ocean thermal electric conversion methods, as well as their pros and cons, and applications.
C416.6	Compare the Advantages and disadvantages of biogas generation, photosynthetic processes, and biogas production plants.

Course Name: C417 CAM and Automation-Lab (PC460ME)

CO. No.	Description
C417.1	Gain working knowledge in writing CNC part Program, simulate using CAM software 's and understand the manufacture components on CNC machines
C417.2	Develop robot programs for simulating various tasks like pick and place, stacking etc., using standard robot simulation software 's like Robot studio, Microsoft Robotics Developer Studio or any equivalent OPEN-SOURCE software 's.
C417.3	Gain working knowledge in simulation of Pneumatic, Hydraulic and PLC simulator.
C417.4	Apply these learnings to automate & improve efficiency of manufacturing process.
C417.5	Practically relate to concepts discussed in Computer Integrated Manufacturing course.

Course Name: C418 Summer Internship (PW701ME)

CO. No.	Description
C418.1	Design/develop a small and simple product in hardware or software.
C418.2	Complete the task or realize a pre specified target, with limited scope, rather than taking up acomplex task and leave it.
C418.3	Learn to find alternate viable solutions for a given problem.
C418.4	Evaluate these alternatives with reference to pre specified criteria.
C418.5	Implement the selected solution and document the same.

Course Name: C419 Project -I (PW702ME)

CO. No.	Description
C419.1	Demonstrate the ability to synthesize and apply the knowledge and skills acquired in the academic program to the real-world problems.
C419.2	Evaluate different solutions based on economic and technical feasibility
C419.3	Effectively plan a project and confidently perform all aspects of project management
C419.4	Demonstrate effective written and oral communication skills