LORDS INSTITUTE OF ENGINEERING & TECHNOLOGY
(UGC Autonomous)
Approved by AICTE | Affiliated to Osmania University | Estd. 2003
Accredited with 'A' grade by NAAC | Accredited by NBA
Department of Mechanical Engineering

Course Outcomes

A.Y: 2025-2026

Year & Semester: II & III

Student will be able to

Course Name: C31 Mathematics – III (PDE & PS) (U24MA302)

CO. No.	Description
C31.1	Solve the first order linear and non linear partial differential equations.
C31.2	Grasp the knowledge of second order PDE and its method of solution.
C31.3	Compute the statistical parameters of some standard discrete and continuous probability distributions and moments.
C31.4	calculate the parameters related to correlation, regression and obtain the knowledge of sampling Theory with context to test of hypothesis
C31.5	Analyze and check the validity of statement using testing of hypothesis for various parameters and goodness of fit

Course Name: C32 Fundamentals of Electrical Engineering (U24EE308)

CO. No.	Description
C32.1	Analyze DC electrical circuits and measure the parameters of electrical energy.
C32.2	Analyze AC electrical circuits and measure the parameters of electrical energy.
C32.3	Comprehend the working principles of Electrical DC Machines and Transformers
C32.4	Comprehend the working principles of Electrical AC machines.
C32.5	Identify various electrical switchgear components and installations.

Course Name: C33 Metallurgy and Material science (U24ME301)

CO. No.	Description
C33.1	Apply the fundamentals of materials engineering to classify materials, analyze bonding in solids, interpret crystal structures, and evaluate mechanical properties like elasticity and toughness.
C33.2	Apply concepts of crystal structures, dislocations, and mechanical properties to explain material behaviour during processes like cold working and strain hardening.
C33.3	Analyze the impact of fatigue, fracture, and creep on materials, examining factors like crack propagation and deformation mechanisms.
C33.4	Evaluate the properties and applications of various alloys and the effects of alloying elements on material performance.
C33.5	Evaluate heat treatment processes and select appropriate hardening techniques based on T.T.T. diagrams and material requirements.

Course Name: C34 Mechanics of Solids (U24ME302)

CO. No.	Description
C34.1	Explain the basic concepts of stresses and strain their relations for different sections and identify the behavior of the solid bodies, composite bars, and thermal stresses and strain energy, subjected to various types of loading.
C34.2	Apply the concepts of S.F and B.M for drawings of S.F and B.M diagrams for different beams with different loads and locate the maximum B.M and point of contra flexure, and deflection of beams.
C34.3	Analyze Bending stresses and shear stress distribution in different sections of beams.
C34.4	Determine Longitudinal and circumferential stresses of thin cylinder and spheres.
C34.5	Analyze the torsional stresses developed in the shafts and also the behavior of the Columns and Struts under different loading.

Course Name: C35 Thermodynamics (U24ME303)

CO. No.	Description
C35.1	Explain fundamental thermodynamics concepts, including system types, properties, processes, energy interactions, and temperature measurement principles.
C35.2	Apply the First Law of Thermodynamics to analyze energy interactions, calculate work and heat transfer in closed and open systems.
C35.3	Illustrate the Second Law of Thermodynamics, analyze entropy changes, and evaluate energy availability in various thermodynamic processes.
C35.4	Analyze thermodynamic properties of fluids, interpret phase changes, and utilize steam tables and diagrams for solving thermodynamic problems.
C35.5	Analyze and compare the performance of various power cycles.

Course Name: C36 Metallurgy and Material Testing Lab (U24ME3L1)

CO. No.	Description
C36.1	Recall the working principles of metallurgical microscopes and common material testing equipment.
C36.2	Explain the microstructures of various ferrous and non-ferrous metals and alloys based on metallographic analysis.
C36.3	Perform mechanical tests such as tensile, compression, and hardness tests to determine material properties.
C36.4	Analyze the effects of heat treatment and alloy composition on the microstructure and mechanical behaviour of metals.
C36.5	Develop a comprehensive report that integrates metallographic and mechanical test data to evaluate material suitability for engineering applications.

Course Name: C37 Machine Drawing and Modelling Lab (U24ME3L2)

| CO. No.	Description
C37.1	Create and format drawing sheets with appropriate title blocks in AutoCAD, following standard conventions for professional and technical drawings.
C37.2	Apply the fundamental conventions for drawing lines, dimensioning, and sectional views according to industrial standards in AutoCAD.
C37.3	Create accurate drawings of simple machine elements, such as shafts, gears, and pulleys, using the correct dimensional standards and sectional views in AutoCAD.

CO. No.	Description
C37.4	Design and present detailed assembly drawings of components such as connecting rods and eccentrics, ensuring proper alignment and interaction between parts in SOLIDWORKS.
C37.5	Demonstrate proficiency in designing mechanical systems by creating assembly models of components like pedestal bearings (Plummer blocks) and screw jacks, integrating them with accurate material properties and movement simulations.

Course Name: C38 Fundamentals of Electrical Engineering Lab (U24EE3L4)

CO. No.	Description
C38.1	Get an exposure to common electrical components and their ratings.
C38.2	Comprehend the usage of common electrical measuring instruments.
C38.3	Analyze the Laws and theorems in DC circuit
C38.4	Analyze the voltage and currents in RL, RC and RLC Circuits.
C38.5	Test the basic characteristics of transformers and electrical machines
C38.6	Analyze the performance of DC Motors and DC Generators.

Course Name: C39 Design Thinking Lab (U24DT3L1)

CO. No.	Description
C39.1	Listen and interpret spoken language productively.
C39.2	Understand and apply the design thinking process.
C39.3	Conduct field research and empathize with user needs.
C39.4	Define clear and relevant problem statements.
C39.5	Generate and evaluate innovative ideas collaboratively.
C39.6	Create and test functional prototypes.
C39.7	Gather feedback and refine solutions iteratively.
C39.8	Communicate project outcomes through storyboards and pitches.
C39.9	Contribute to community development through ethical, sustainable design.
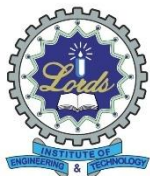
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Course Outcomes

A.Y: 2025-2026

Year & Semester: III & V

Student will be able to

Course outcomes: C51 – Mechanics of Fluids and Hydraulic Machinery (U23ME501)

CO. No.	Description
C51.1	Identify the various fluid properties and pressure measurement techniques for determining the behavior of the fluids at static and in motion.
C51.2	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.
C51.3	Apply appropriate equations and principles to analyze problems and losses in pipe flows.
C51.4	Interpret and apply performance laws to turbomachines of different types.
C51.5	Demonstrate the working principles of various hydraulic turbines and estimate their performances.
C51.6	Estimate performance parameters of a given Centrifugal and Reciprocating pump.

Course outcomes: C52 – Dynamics of Machines (U23ME502)

CO. No.	Description
C52.1	Apply concepts of static and dynamic force analysis to evaluate planar mechanisms and determine the effect of gyroscopic motion on vehicle stability.
C52.2	Demonstrate governing principles to study the performance and behavior of governors and flywheels in mechanical systems.
C52.3	Analyze mechanical systems involving friction, clutches, and brakes to solve performance-related problems.
C52.4	Evaluate balancing strategies for rotating and reciprocating masses in engines and machinery to minimize dynamic effects.
C52.5	Assess vibration models for mechanical systems using analytical and approximate methods to predict system behavior.

Course outcomes: C53 – Design of Machine Elements (U23ME503)

CO. No.	Description
C53.1	Apply the fundamentals of design of machine elements, and behavior of members subjected to various typesof complex loads, and criteria of failure to satisfy the applications.
C53.2	Identify the principles involved in evaluating the shape and dimensions of a component, when subjected to various types of fatigue loading, and methods to reduce the stress concentration.
C53.3	Design the shafts used in various industrial applications.
C53.4	Map out and design the different Couplings used in different industrial applications.
C53.5	Design the machine components joined by Riveted, Welded and bolted joints, and to analyze the differentways in which riveted and welded joints can fail.

Course outcomes: C54 –Renewable Energy Resources (U23ME507)

CO. No.	Description
C54.1	Summarize the renewable and non-renewable sources of energy.
C54.2	Acquire the knowledge of various components, principle of operation and present scenario ofdifferent conventional and non-conventional sources.
C54.3	Explain the use of solar energy and the various components used in the energy production withrespect to applications.
C54.4	Design wind turbine blades and know about applications of wind energy for water pumping andelectricity generation.
C54.5	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 energy.

Course outcomes: C55 – Disaster preparedness and management (U23CE509)

CO. No.	Description
C55.1	Learn about the basic principles of disaster management and the types of disasters
C55.2	Understand the disaster management cycle and framework.
C55.3	Know about the disaster management systems in India and the applications of the latest technologies in disaster management
C55.4	Understand about the different types of disasters.
C55.5	Know about the past disasters occurred across the globe.

Course outcomes: C56 – Mechanics of Fluids and Hydraulic Machinery Lab (U23ME5L1)

CO. No.	Description
C56.1	Apply the principles of different flow measuring instruments and their adoptability to the industry.
C56.2	Calibrate flow measuring devices such as venturimeter and orifice meter.
C56.3	Determine and analyse the friction factor for a given pipe line.
C56.4	Determine and compare the coefficient of impact of jet on vanes at different flow rates.
C56.5	Investigate through experimentation different types of pump models and estimate their performance under different working conditions.
C56.6	Estimate the performance of hydraulic turbines at constant speed and constant head.

## Course outcomes: C57 – Dynamics of Machines Lab (U23ME5L2)

CO. No.	Description
C57.1	Determine the natural frequency and time period of simple and compound pendulums using experimental methods.
C57.2	Analyze free and torsional vibrations in damped and undamped systems using experimental setups.
C57.3	Evaluate cam follower motion for different cam profiles based on displacement, velocity, and acceleration curves.
C57.4	Investigate the gyroscopic effects and estimate the gyroscopic couple in rotating systems.
C57.5	Examine and compare the performance of Watt and Porter governors by studying controlling force curves and sleeve motion.

Course outcomes: C58 – Research Writing (U23EN5L2)

CO. No.	Description
C58.1	Demonstrate the ethics and nuances of plagiarism.
C58.2	Construct the topic of research and formulate hypothesis.
C58.3	Analyze the research process elaborately.
C58.4	Organize and rephrase the data in a sequential order as per format.
C58.5	Interpret the data by the use of methodology and discussion.

Course outcomes: C59 – Internship-1 (U23ME5P1)

CO. No.	Description
C59.1	Design/develop a small and simple product in hardware or software.
C59.2	Complete the task or realize a pre specified target, with limited scope, rather than taking up a complex task and leave it.
C59.3	Learn to find alternate viable solutions for a given problem.
C59.4	Evaluate these alternatives with reference to pre specified criteria.
C59.5	Implement the selected solution and document the same.
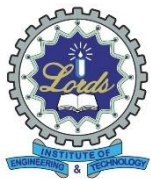
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Course Outcomes

A.Y: 2025-2026

Year & Semester: IV & VII

Student will be able to

Course Name: C71 Finite Element Techniques (U21ME701)

CO. No.	Description
C71.1	Analyze basic equations of elasticity and formulate finite element modelling of one-dimensional element using Potential energy approach.
C71.2	Evaluate finite element modelling of truss and beam elements along with the concepts of transformation from local to global matrices.
C71.3	Develop stiffness matrix for a plane stress & plane strain conditions on a CST, Axi-symmetric elements by interpolating shape functions in natural coordinate system.
C71.4	Formulate finite element model to steady state heat transfer analysis using one- & two-dimensional elements.
C71.5	Formulate mass and stiffness matrices of 1D & beam elements to establish Eigen values &Eigen vectors using Lagarangian and Hamilton principles.

Course Name: C72 Metrology and Instrumentation (U21ME702)

CO. No.	Description
C72.1	Explain the basic principles of engineering metrology, linear and angular measurement techniques, and limits and fits.
C72.2	Apply various types of comparators and instruments to measure form errors such as straightness, flatness, roundness, and complex geometries using CMM.
C72.3	Analyze surface roughness, thread and gear parameters, and assess the geometric accuracy of machine tools.
C72.4	Evaluate measurement systems and transducers for displacement, strain, and load using strain gauges and instrumentation techniques.
C72.5	Apply suitable transducers and thermocouples for measuring pressure, displacement, acceleration, and temperature.

Course Name: C73 Refrigeration & Air Conditioning (U21ME703)

CO. No.	Description
C73.1	Apply the fundamental principles of refrigeration, refrigeration methods, and refrigerant properties to assess environmental impacts.
C73.2	Analyze vapour compression refrigeration systems, including components, T-S and P-H diagrams, and performance enhancement methods.
C73.3	Examine vapor absorption and steam jet refrigeration systems to understand their configuration, performance, and comparison with conventional systems.
C73.4	Evaluate psychrometric processes and comfort parameters to assess their suitability in air conditioning system design.

CO. No.	Description
C73.5	Design air conditioning systems for various applications by performing detailed cooling load calculations and selecting appropriate components.

Course Name: C74 Startup Management (U21ME703)

CO. No.	Description
C74.1	Understand Indian Industrial Environment, Entrepreneurship and Economic growth, Small and Large Scale Industries, Types and forms of enterprises.
C74.2	Identify the characteristics of entrepreneurs, Emergence of first generation entrepreneurs, Conception and evaluation of ideas and their sources.
C74.3	Practice the principles of project formulation, Analysis of market demand, Financial and profitability analysis and Technical analysis.
C74.4	Understand the concept of Intellectual Property Rights and Patents
C74.5	Comparand the aspects of start-ups.

Course Name: C75 Production and Operation Management (U21ME706)

CO. No.	Description
C75.1	Analyse various types of Production Systems, develop suitable layout for a given plant.
C75.2	Develop various methods for work study and apply suitable recording techniques. Establish standard procedures and time standards for the operations.
C75.3	Analyze various qualitative and quantitative forecasting models for moving average, regression analysis, and evaluate forecast errors of MAD, MSE, MAPE to assess their accuracy and applicability for predicting demand patterns.
C75.4	Apply strategies for aggregate planning, master scheduling, and MRP to optimize production, using ERP systems like SAP and PeopleSoft for efficient resource planning.
C75.5	Analyze network fundamentals and project management techniques such as critical path method, float analysis, and project crashing to evaluate project schedules and allocate resources effectively for successful project completion.

Course Name: C76 – Additive Manufacturing Technology (U21ME710)

CO. No.	Description
C76.1	Explain the fundamental concepts of 3D Printing and process parameters of additive manufacturing processes
C76.2	Select the suitable material and process for fabricating a given product.
C76.3	Describe the working principle and applications of liquid, solid and Powder based 3D Printing Technologies.
C76.4	Compare and contrast additive manufacturing processes with conventional manufacturing methods in terms of rate, quality, flexibility, part complexity and cost.
C76.5	Evaluate the emerging applications of AM across major industries, including medical, dental, aerospace, vehicle structures, and consumer products and gain hands on experience in designing and fabricating AM parts.

Course Name: C77 Metrology and Instrumentation Lab (U21ME7L1)

CO. No.	Description
C77.1	Measure the length and diameter using vernier callipers.
C77.2	Determine the bore diameter of the given specimen.
C77.3	Evaluate tolerances, taper angles, roundness, and roughness for a component
C77.4	Calibrate the temperature transducer using thermometer setup.
C77.5	Calibrate the LVDT setup using micrometer.
C77.6	Illustrate the concept of strain gauge using cantilever beam setup and calibrate the load cell.

Course Name: C78 Technical Seminar-1 (U21ME7P2)

CO. No.	Description
C78.1	Interpretation and Solution of real life engineering problems by applying Knowledge.
C78.2	Conduct literature survey on a current topic based on peer reviewed literature & Identify research gap in the literature
C78.3	Develop presentation slides / report arranging the material coherently
C78.4	Compile the content and prepare comprehensive report.
C78.5	Demonstrate skills required for preparation of a technical report Present seminar and write precise technical reports in a nutshell.
C78.6	Participates effectively in multi-disciplinary and heterogeneous teams exhibiting team work, Inter-personal relationships, conflict management and leadership quality.

Course Name: C79 Aptitude and Reasoning Lab (U21MA7L1)

CO. No.	Description
C79.1	Build proficiency in quantitative reasoning
C79.2	Improve critical thinking skills
C79.3	Enhance analytical skills
C79.4	Demonstrate quantitative aptitude concepts
C79.5	Adapt principles of quantitative aptitude to achieve qualitative results.

Course Name: C710 Internship-2 (U21ME7P1)

CO. No.	Description
C710.1	Design/develop a small and simple product in hardware or software.
C710.2	Complete the task or realize a prespecified target, with limited scope, rather than taking up a complex task and leave it.
C710.3	Find alternate viable solutions for a given problem and evaluate these alternatives with reference to prespecified criteria.
C710.4	Implement the selected solution and document the same.
C710.5	Write a technical report and present it to appropriate audience