

LORDS INSTITUTE OF ENGINEERING & TECHNOLOGY

(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: 2024-25

Semester: IV (A)

Student will be able to

Course Name: C41 Business Economics and Financial Analysis (U23MB401)

CO. No.	Description
C41.1	Describe the basic concepts of business structures, types of business entities, and the sources of capital and finance, including non-conventional sources.
C41.2	Explain the significance of economics, the distinction between micro and macroeconomic concepts, and the phases of the business cycle in a business context.
C41.3	Apply the concepts of demand and supply analysis, elasticity, and demand forecasting to real-world economic and business scenarios.
C41.4	Analyze the cost structure, production functions, and market structures to understand competitive strategies and pricing mechanisms.
C41.5	Evaluate financial performance using accounting principles, ratio analysis, and cash flow analysis for effective decision-making in business.

Course Name: C42 English for Technical Communication (U23EN401)

CO. No.	Description
C42.1	Define the key features, types, and processes of technical communication and distinguish between general and technical writing.
C42.2	Explain the importance, structure, and purpose of official correspondence such as emails, business letters, and business proposals in technical communication.
C42.3	Apply technical writing principles to create reports like feasibility, project, progress, and evaluation reports in professional contexts.
C42.4	Analyze the structure and components of various manuals, such as user manuals, product manuals, and operations manuals, to understand their relevance and utility.
C42.5	Evaluate the effectiveness of information transfer between verbal and non-verbal formats (e.g., charts, diagrams) and assess the key aspects of oral and visual presentations.

Course Name: C43 Manufacturing Processes (U23ME401)

CO. No.	Description
C43.1	Describe the fundamental concepts and terminology related to casting, moulding, and gating systems, including casting defects, their causes, and remedies.
C43.2	Demonstrate the use of various special casting processes, such as shell moulding, die casting, and centrifugal casting, as well as processing techniques for plastics and powder metallurgy.
C43.3	Differentiate between various welding processes, including gas welding, arc welding, and resistance welding, by analyzing their principles, equipment, and applications.
C43.4	Evaluate solid-state welding processes, such as friction welding and explosive welding, and identify common welding defects along with their causes and remedies.
C43.5	Assess the advantages and limitations of forming processes, including extrusion, forging, and advanced high-energy rate forming techniques, for specific industrial applications.

Course Name: C44 Applied Thermodynamics (U23ME402)

CO. No.	Description
C44.1	Categorize the types of reciprocating air compressors and their applications.
C44.2	Explain the working principles of four-stroke and two-stroke engines, and compare their performance parameters.
C44.3	Apply the concepts of combustion phenomena to evaluate the performance of Spark Ignition and Compression Ignition engines.
C44.4	Analyze the efficiency and work input relations for steam boilers, including the comparison of various types of boilers and mountings.
C44.5	Evaluate a steam power plant cycle incorporating concepts such as superheating, reheating, and regeneration to optimize efficiency.

Course Name: C45 Kinematics of Machines (U23ME403)

CO. No.	Description
C45.1	Classify kinematic pairs, mechanisms, and machines while describing the motion constraints using criteria like Kutzbach and Grubler.
C45.2	Perform velocity and acceleration analysis of mechanisms using graphical, analytical, and instantaneous center methods.
C45.3	Analyze straight-line motion mechanisms, steering gears, and Hooke's joints for practical applications.
C45.4	Evaluate the motion and design of cams and followers, including their displacement and velocity characteristics.
C45.5	Apply fundamental kinematic principles to evaluate mechanical systems for efficient motion transfer.

Course Name: C46 Soft Skills and Employability Skills Lab (U23EN4L1)

CO. No.	Description
C46.1	Identify the fundamentals of interpersonal communication, reading comprehension techniques, and writing skills for professional purposes.
C46.2	Explain the concepts of effective oral presentations, group discussions, and interview skills, including body language, voice modulation, and idea organization.
C46.3	Demonstrate reading, writing, and speaking skills by engaging in activities like scanning, skimming, resume writing, and role-plays in interpersonal communication.
C46.4	Analyze the dynamics of group discussions and interviews to assess the effectiveness of communication strategies and interaction techniques.
C46.5	Evaluate resumes, cover letters, oral presentations, and interview responses based on structure, content, and delivery using established rubrics.

Course Name: C47 Manufacturing Processes Lab (U23ME4L1)

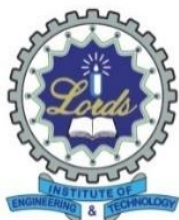
CO. No.	Description
C47.1	Describe the fundamental principles of pattern making, considering draft, shrinkage, and machining allowances.
C47.2	Demonstrate the green sand molds with appropriate gating and rise ring systems.
C47.3	Analyze the mechanical properties of weld joints through strength and hardness testing.
C47.4	Synthesize and perform forming operations such as drawing, blanking, and piercing on different materials.
C47.5	Design and Optimize plastic components using injection and blow molding processes for improved manufacturability.

Course Name: C48 Thermal Engineering Lab (U23ME4L2)

CO. No.	Description
C48.1	Explain the working principles of reciprocating air compressors, Diesel engines, and Petrol engines by interpreting valve and port timing diagrams.
C48.2	Conduct and analyze performance tests on single and multi-cylinder engines, including tests for volumetric efficiency, mechanical efficiency, and economical speed.
C48.3	Examine the heat balance in Diesel engines and assess the influence of various operating parameters on engine performance.
C48.4	Evaluate the viscosity, flash, and fire points of fuels and lubricants to assess their suitability for engine operation under varying conditions.
C48.5	Compare the performance of engines with variable compression ratios and recommend suitable configurations for different applications through Morse and other advanced tests.

Course Name: C49 Programming Language-II (U23CS4L3)

CO. No.	Description
C49.1	Write, Test, Debug python library modules.
C49.2	Develop python programs using library modules
C49.3	Implement python programs using pandas
C49.4	Develop python programs using Matplotlib Module



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Course Outcomes

A.Y: 2024-25

Semester: VI (A)

Student will be able to

Course outcomes: C61 – Metal Cutting and Machine Tools (U21ME601)

CO. No.	Description
C61.1	Explain the fundamental principles of chip formation, cutting tool geometry, tool materials, and the mechanics of orthogonal and oblique cutting processes.
C61.2	Demonstrate the use of cutting force measurement techniques and analyze thermal aspects of metal cutting, including heat generation, temperature distribution, and cutting fluid applications.
C61.3	Compare the constructional features, operations, and mechanisms of various machine tools, such as lathes, drilling machines, milling machines, and broaching machines, with a focus on their industrial applications.
C61.4	Examine abrasive processes, including grinding, lapping, and honing, and evaluate gear and thread manufacturing techniques for their suitability in different production scenarios.
C61.5	Design jigs and fixtures based on workpiece requirements and evaluate unconventional machining processes, such as EDM, ECM, and laser machining, for advanced industrial applications.

Course outcomes: C62 – Design of Machine Elements-II (U21ME602)

CO. No.	Description
C62.1	Describe the principles, materials, and stress analysis of springs, belts, wire ropes, and their applications in mechanical systems.
C62.2	Apply fundamental principles to select, design, and evaluate flat and V-belts, wire ropes, and bearings for specific applications.
C62.3	Analyze the performance of sliding and rolling contact bearings under various loading and lubrication conditions.
C62.4	Evaluate stresses and forces in engine components like pistons, connecting rods, and curved beams for efficient and safe designs.
C62.5	Design gear drives (spur, helical, and bevel) based on strength, wear, and dynamic loading, adhering to industry standards.

Course outcomes: C63 – Heat Transfer (U21ME603)

CO. No.	Description
C63.1	Explain the governing laws and modes of heat transfer, derive general heat conduction equation in various coordinate systems and apply concept of electrical analogy on various thermal systems.
C63.2	Solve the problems of steady state and transient heat conduction with simple and multi-layer boundary conditions.
C63.3	Analyze heat transfer coefficients for free and forced convection, considering boundary layers.
C63.4	Analyse heat exchanger performance by using the methods of LMTD and NTU.
C63.5	Interpret time dependent heat transfer and compute convective heat transfer coefficients in natural and forced convection.

Course outcomes: C64 – CAD/ CAM/CAE (U21ME604)

CO. No.	Description
C64.1	List fundamental concepts related to CAD systems, geometric modelling, and product life cycles in both conventional and computer-based manufacturing systems.
C64.2	Explain the key principles of geometric modelling and surface modelling techniques such as wireframe, cubic, Bezier, and B-spline curves.
C64.3	Use CAD software to create basic 3D wireframe models, apply geometric modelling technique, and generate simple surface models such as surfaces of revolution and blends.
C64.4	Analyze complex CAD models by breaking them down into their component parts.
C64.5	Critically evaluate different CAD modelling techniques based on specific design requirements. Assess the effectiveness of various quality control methods used in computer-aided testing.

Course outcomes: C65 –Road Safety Engineering (U21CE609)

CO. No.	Description
C65.1	Describe the fundamentals of traffic safety analysis.
C65.2	Apply road safety concepts in urban transportation.
C65.3	Implement crack reduction techniques for road safety improvement.
C65.4	Analyze accident data to identify trends and safety issues.
C65.5	Design urban infrastructure with a focus on safety considerations.

Course outcomes: C66 – Metal Cutting and Machine Tools Lab (U21ME6L1)

CO. No.	Description
C66.1	Explain the fundamental operations performed on lathe, shaper, milling, and grinding machines, including tool geometry and machining principles.
C66.2	Perform machining operations such as turning, taper turning, knurling, thread cutting, drilling, boring, and grinding to produce components with desired specifications.
C66.3	Analyze the results of machining exercises, such as geometrical accuracy and surface finish, and evaluate their compliance with design requirements.
C66.4	Examine the use of threading tools, taps, dies, and milling cutters for thread production and assess their effectiveness in achieving precise thread profiles.
C66.5	Evaluate the performance and geometrical accuracy of machine tools such as lathes, shapers, slotting, and grinding machines through geometric testing and tool angle grinding exercises.

Course outcomes: C67 – Heat Transfer Lab (U21ME6L2)

CO. No.	Description
C67.1	Relate the basic concepts of heat transfer demonstrated in the composite slab apparatus and heat transfer through lagged pipe experiments.
C67.2	Explain the principles of transient heat conduction and the significance of overall heat transfer coefficients in thermal systems.
C67.3	Apply the principles of forced and natural convection to conduct experiments and interpret heat transfer data from relevant apparatus.
C67.4	Analyze the performance of heat exchangers of parallel and counter flow, and identify key factors affecting their efficiency.
C67.5	Optimize heat transfer system by synthesizing experimental results from apparatus like the critical heat flux and emissivity tests to improve efficiency.

Course outcomes: C68 – CAD/CAM/CAE Lab (U21ME6L3)

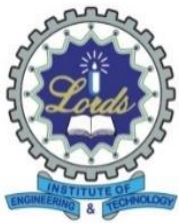
CO. No.	Description
C68.1	Describe 2D, 3D beams and truss analysis, meshing techniques, and the effects of static and thermal loading on structural components.
C68.2	Apply finite element analysis methods to perform static, buckling, and modal analysis on structural and mechanical components like plates, shells, and beams.
C68.3	Analyze the behaviour of materials and structures under various loading conditions, including stress-strain analysis, failure behaviour, and stress concentration factors using FEA tools.
C68.4	Evaluate the performance of aero foil designs, heat transfer phenomena, and transient responses using Computational Fluid Dynamics (CFD) and thermal analysis techniques.
C68.5	Design and develop complex CAD models, perform advanced simulations, and integrate customized analytical solutions using programming tools like MATLAB.

Course outcomes: C69 – Research Writing (U21EN6L1)

CO. No.	Description
C69.1	Define the fundamentals of research, including its purpose, types, ethics, plagiarism, and the basic format of a research paper.
C69.2	Explain the research process steps, including topic selection, hypothesis formulation, data collection, and data analysis, along with their significance in academic research.
C69.3	Apply research methodologies to structure a research paper, focusing on the title, abstract, introduction, literature review, and methodology sections.
C69.4	Analyze collected data to interpret findings and present them effectively in the form of research discussions and results.
C69.5	Evaluate the quality of research papers by assessing their adherence to ethical standards, proper documentation, and logical organization of content.

Course outcomes: C610 – Mini Project (U21EN6P1)

CO. No.	Description
C610.1	Gather effectively and interpret information from literature survey.
C610.2	Identify the gaps and write the problem statement with specific objectives.
C610.3	Develop methods for selection of materials to develop project.
C610.4	Consider alternate assumptions, approaches, and procedures to carry out calculations involved in experiment for analyze and discuss the results to draw valid Conclusions
C610.5	Prepare a report as per recommended format and defend the work.



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Course Outcomes

A.Y:2024-25

Semester: VIII (A)

Student will be able to

Course Name: C81 Product Development and Process Planning (U21ME802)

CO. No.	Description
C81.1	Describe the key concepts, stages, and strategies in product development and process planning.
C81.2	Apply the knowledge of Benchmarking, Establishing Engineering Specifications and Product Architecture in product design.
C81.3	Explain the techniques of Product Function, product design and product architecture.
C81.4	Utilize the computers for the management of the manufacturing process
C81.5	Assess the entire product lifecycle (from conception to obsolescence) and suggest improvements based on feedback and performance analysis.

Course Name: C82 Manufacturing Automation (U21ME807)

CO. No.	Description
C82.1	Describe the concept of automation, its importance, and current trends.
C82.2	Explain the principles and applications of additive manufacturing.
C82.3	Apply the principles of Computer-Integrated Manufacturing (CIM) to optimize manufacturing processes.
C82.4	Analyze solid modeling techniques for design, analysis, and problem-solving.
C82.5	Create innovative automated systems integrating hardware and software.

Course Name: C83 Entrepreneurship (U21MB802)

CO. No.	Description
C83.1	Understand Indian Industrial Environment, Entrepreneurship and Economic growth, Small- and Large-Scale Industries, Types and forms of enterprises.
C83.2	Explain the behavioural aspects of entrepreneurs, Time Management, Various approaches of time management, their strengths and weakness. The urgency addiction and time management matrix.
C83.3	Infer the characteristics of entrepreneurs, Emergence of first-generation entrepreneurs, Conception and evaluation of ideas and their sources.
C83.4	Apply the concepts of Project Management during construction phase, project organization, project planning and control using CPM, PERT techniques.
C83.5	Contrast the principles of project formulation, Analysis of market demand, Financial and profitability analysis and technical analysis.
C83.6	Assess behavioral, leadership and time management aspects in entrepreneurial journey.

Course Name: C84 Technical Seminar-2 (U21ME8P1)

CO. No.	Description
C84.1	Interpretation and Solution of real life engineering problems by applying Knowledge.
C84.2	Conduct literature survey on a current topic based on peer reviewed literature & Identify research gap in the literature
C84.3	Develop presentation slides / report arranging the material coherently
C84.4	Compile the content and prepare comprehensive report.
C84.5	Demonstrate skills required for preparation of a technical report Present seminar and write precise technical reports in a nutshell.
C84.6	Participates effectively in multi-disciplinary and heterogeneous teams exhibiting team work, Inter-personal relationships, conflict management and leadership quality.

Course Name: C85 Comprehensive Viva (U21ME8P2)

CO. No.	Description
C85.1	Demonstration of In-depth Subject Knowledge
C85.2	Estimate the effective communication and articulation
C85.3	Apply critical thinking and analysis
C85.4	Categorize research and its applications.
C85.5	Synthesize confidence and stress management

Course Name: C86 Major Project (U21ME8P3)

CO. No.	Description
C86.1	Gather effectively and interpret information from literature survey.
C86.2	Identify the gaps and write the problem statement with specific objectives.
C86.3	Develop methods for selection of materials to develop project.
C86.4	Consider alternate assumptions, approaches, and procedures to carry out calculations involved in experiment for analyze and discuss the results to draw valid Conclusions
C86.5	Prepare a report as per recommended format and defend the work and explore the possibility of publishing papers in peer reviewed journals/conference proceedings.