Department of Mechanical Engineering

COURSE OUTCOMES (COs)

A.Y. 2022-23 **Term - ODD** **Semester – VII**

MEC701/MEL701 – Design of Mechanical System

MEC701.1	The students will be able to understand the Methodology & Morphology of design and apply the concept of system design.
MEC701.2	The students will be able to make graphical representation of speeds, structure diagram, ray diagram, selection of optimum ray diagram and prepare layout of machine tool gear box and select number of teeth on each gear.
MEC701.3	The students will be able to understand the layout of Hoisting Mechanism and Design material handling systems such as hoisting mechanism of EOT crane.
MEC701.4	The students will be able to understand the layout of belt conveyor system, its application and design the components of belt conveyor system.
MEC701.5	The students will be able to design engine components such as cylinder, piston, connecting rod and crankshaft.
MEC701.6	The students will be able to classify gear pump and centrifugal pump and design their main components for the given applications.

MEC702 – Logistics and Supply Chain Management

MEC702.1	The students will be able to understand Logistics and Supply Chain Management concepts, stages, key issues, strategies and supplier selection criteria.
MEC702.2	The students will be able to identify the drivers of supply chain performance tools, risks in supply chain management and supplier performance measurement tools such as supplier capacity analysis and supplier score card.
MEC702.3	The students will be able to apply various techniques of inventory management (EOQ model and buffer stock) and rank the items using inventory management techniques such as ABC Analysis, and VED Analysis.
MEC702.4	The students will be able to understand the logistics management and to apply various strategies and techniques to minimize overall logistics cost.
MEC702.5	The students will be able to understand the role of digitization in supply chain management leading to sustainability and to apply the IT infrastructure into TMS (Transport Management System), WMS (Warehouse Management System).
MEC702.6	The students will be able to apply various mathematical models/tools to design the supply chain network such as transportation problem, vehicle routing problem, travelling salesman problem, capacitated transhipment problem, shortest path problem.

MEDLO7032– Renewable Energy Systems

MEDLO7032.1	The students will be able to describe the need for renewable energy and its potential for the development of a sustainable environment.
MEDLO7032.2	The students will be able to analyze different solar collectors using geometrical parameters and photovoltaics for generation of solar energy.
MEDLO7032.3	The students will be able to Identify and analyze various wind turbine energy harnessing techniques.
MEDLO7032.4	The students will able to Design biogas plant for harnessing energy from organic waste.
MEDLO7032.5	The students will able to Describe significance of hydrogen energy to fulfil present and future energy needs.
MEDLO7032.6	The students will be able to Describe the operating principle of geothermal energy and ocean energy and their role in sustainable development.

MEDLO7033 – Vehicle Systems

MEDLO7033.1	The students will be able to understand different vehicle body systems and layouts.
MEDLO7033.2	The students will be able to illustrate working and functions of different vehicle mechanical, electrical and chassis systems
MEDLO7033.3	The students will be able to understand the working of different vehicle systems and subsystems.
MEDLO7033.4	The students will be able to understand the working of different vehicle electrical systems and subsystems.
MEDLO7033.5	The students will be able to understand the effect of aerodynamics on the functioning of a vehicle.
MEDLO7033.6	The students will be able to comprehend the different technological advances in vehicle systems.

MEDLO7041 – Machinery Diagnostics

MEDLO7041.1	The students will be able to relate the basic concepts of Vibration Condition Monitoring to Machinery Diagnostics.
MEDLO7041.2	The students will be able to explain the working of various Vibration Measuring Instruments.
MEDLO7041.3	The students will be able to apply different Data Acquisition and Signal Processing techniques in Vibration Measurements.
MEDLO7041.4	The students will be able to investigate for various common faults, like unbalance, misalignment, mechanical looseness, etc. in machines, like pumps, blowers, fans, etc., using Vibration Spectrum.
MEDLO7041.5	The students will be able to evaluate the application of Vibration based Condition Monitoring for Machinery Diagnostics through case studies.

MEDLO7043 – Advanced Vibration

MEDLO7043.1	The students will be able to compute the natural frequencies and mode shapes of a multi degree of freedom system and explain the modal analysis of a vibrating system.
MEDLO7043.2	The students will be able to understand the concepts of Vibration Isolation and Control and explain different types of vibration absorbers, and Vibration dampers.
MEDLO7043.3	The students will be able to classify different vibration measuring instruments, Explain vibration analysis concepts and experimental techniques including modal analysis.
MEDLO7043.4	The students will be able to analyze vibration of continuous system such as beams and rods.
MEDLO7043.5	The students will be able to apply tools from probabilistic modelling to analyze dynamic systems while accounting for variability and uncertainties that are inevitably present in real engineered systems.
MEDLO7043.6	The students will be able to identify the non-linear phenomena for finite degree-of-freedom systems and use different methods like Method of isoclines, Perturbation method, Method of iteration to analyze Non-Linear vibrations.

ILO7011 – Product Life Cycle Management

ILO7011.1	The students will be able to understand knowledge about phases of PLM, PLM strategies and methodology for PLM feasibility study and PLM implementation by developing PLM Vision with different applications.
ILO7011.2	The students will be able to illustrate various approaches and techniques for designing and developing products by applying product engineering guidelines / thumb rules, Design process models, New Product Development (NPD) and Strategies in designing products.
ILO7011.3	The students will be able to acquire knowledge of Product Data Management and PDM systems by generating product Data, providing financial justification of PDM and identifying barriers to PDM implementation.
ILO7011.4	The students will be able to acquire knowledge in applying virtual product development tools for components, machining and manufacturing plant by realistic rendering techniques, Digital mock-up, Model building, Model analysis, Modelling and simulations in product Design.
ILO7011.5	The students will be able to understand environmental aspects in Product Design with sustainable development by introducing Environmental Strategies into the Design Process, Life Cycle Environmental Strategies and Considerations for Product Design.
ILO7011.6	The students will be able to understand the framework of Life Cycle Assessment and Life cycle approach with Cost Analysis and the Life Cycle Approach, General Framework for LCCA and Evolution of LCA Models.

ILO7013 – Management Information System

ILO7013.1	The students will be able to explain how information systems Transform Business
ILO7013.2	The students will be able to identify the impact information systems have on an organization
ILO7013.3	The students will be able to describe IT infrastructure and its components and its current trends
ILO7013.4	The students will be able to understand the principal tools and technologies for accessing information from databases to improve business performance and decision making
ILO7013.5	The students will be able to identify the types of systems used for enterprise-wide knowledge management and how they provide value for businesses

ILO7014 – Design of Experiments

ILO7014.1	The students will be able to understand hypothesis and its testing.
ILO7014.2	The students will able to develop plan and construct the design for experiment
ILO7014.3	The students will be able to analyze results from investigation to obtain conclusion
ILO7014.4	The students will able to develop new product design or process using different strategies.
ILO7014.5	The students will able to optimize result from design of experiment
ILO7014.6	The students will be able to solve complex engineering problem using tools.

ILO7015 – Operation Research

ILO7015.1	The students will be able to understand the theoretical workings of the simplex method, the relationship between a linear program and its dual, including strong duality and complementary slackness.
ILO7015.2	The students will be able to perform sensitivity analysis to determine the direction and magnitude of change of a model's optimal solution as the data change.
ILO7015.3	The students will be able to solve specialized linear programming problems like the transportation and assignment problems, solve network models like the shortest path, minimum spanning tree, and maximum flow problems.
ILO7015.4	The students will be able to understand the applications of integer programming and a queuing model and compute important performance measures.

ILO7016 – Cyber Security and Laws

ILO7016.1	The students will be able to understand the concept of cybercrime and its effect on outside world.
ILO7016.2	The students will be able to interpret and apply IT law in various legal issues.
ILO7016.3	The students will be able to distinguish different aspects of cyber law.
ILO7016.4	The students will be able to apply Information Security Standards compliance during software design and development.

ILO7017 – Disaster Management and Mitigation Methods

ILO7017.1	The students will be able to understand the concepts of hazard and disaster and their effects with respect to global and Indian scenario.
ILO7017.2	The students will be able to understand the natural as well as manmade disaster and their extent and possible effects.
ILO7017.3	The students will be able to understand the concepts of disaster management and acquainted with disaster management policies.
ILO7017.4	The students will get acquainted with institutional framework and geospatial technologies for disaster management.
ILO7017.5	The students will get acquainted with various finance relief measures, NGOs and international agencies associated with disasters.
ILO7017.6	The students will be able to understand the preventive and mitigation measures during disasters and also simple dos and don’ts in such extreme.