

AMRUTVAHINI COLLEGE OF ENGINEERING, SANGAMNER
Department of Mechanical Engineering
Course Outcome (CO)

Final Year -2015 Course			
Course Code	Course Name	Course Outcomes	
Semester I			
402041	Hydraulics and Pneumatics	C401.1	Understand working principle of components used in hydraulic & pneumatic systems
		C401.2	Identify various types of actuators & accessories used in hydraulic system
		C401.3	Selection of appropriate components required for hydraulic and pneumatic systems
		C401.4	Analyze hydraulic systems for industrial/mobile applications
		C401.5	Identify various parts of pneumatic system & analyze pneumatic system for industrial applications
		C401.6	Design and develop hydraulic and pneumatic system according to the requirements
402042	CAD CAM Automation	C402.1	Apply geometrical transformations, mapping and projections for editing and manipulation of basic geometric entities
		C402.2	Illustrate the mathematical representation of curves and surfaces and methods of solid modeling.
		C402.3	Evaluate the performance of simple mechanical elements like beams, trusses, plates etc. using analytical method and FEA software tool
		C402.4	Develop CNC part program for turning and milling operations manually and using CAM software.
		C402.5	Demonstrate the understanding of various rapid manufacturing techniques and apply it to produce suitable component
		C402.6	Understand the types of automation and robot system, group technology and their applications in manufacturing industries.
402043	Dynamics of Machinery	C403.1	Develop the equation of motion to determine the natural frequency of one d.o.f. free vibrating systems and able to find the effect of damping.
		C403.2	Apply the concept to find the response of one d.o.f. forced vibrating systems, transmissibility, and critical speed of the shaft.

		C403.3	Develop the equation of motion to find the natural frequencies and mode shapes of two degrees of freedom free vibrating systems.
		C403.4	Apply the balancing techniques to solve the static and dynamic balancing problems of rotary systems and reciprocating systems.
		C403.5	Demonstrate the vibration measuring instruments for industrial and real life applications along with suitable method for vibration control.
		C403.6	Explain the noise concepts, its measurement & noise control techniques for industry and day today life problems.
402044 A	Finite Element Analysis (Elective-I)	C404A.1	Understand the concept of finite element method for solving machine design problems
		C404A.2	Formulate and solve manually problems in 1-D structural systems involving bars, trusses, beams.
		C404A.3	Develop 2-D finite element formulations involving triangular, quadrilateral elements & higher order elements.
		C404A.4	Apply the knowledge of FEM for stress analysis, modal analysis, heat transfer analysis.
		C404A.5	Develop algorithms and write finite element code for solving simple design problems and understand the use of commercial packages for complex problems.
402044 C	Heating Ventilation & Air Conditioning (Ele-I)	C404 C.1	Understand & determine the performance parameters of trans-critical & ejector refrigeration systems.
		C404 C.2	Investigate thermal performance of compressor, evaporator, condenser and cooling tower.
		C404 C.3	Describe refrigerant piping design, capacity & safety controls methods and balancing of vapour compressor system.
		C404 C.4	Explain importance IAQ, ventilation and air distribution system
		C404 C.5	Estimate heat transmission through building walls with energy-efficient and cost-effective measures for building envelope.
		C404 C.6	Explain working of types of desiccant, evaporative, thermal storage, radiant cooling, clean room and heat pump air-conditioning systems.
402045 A	Automobile Engineering (Ele-II)	C405 A.1	Compare and select the proper automotive system for the vehicle.
		C405 A.2	Recognize the purpose and requirement of automotive systems and components.

		C405 A.3	Understand the functionality of the automotive components and systems.
		C405 A.4	Analyze the performance of the vehicle.
		C405 A.5	Diagnose the faults of automobile vehicles.
		C405 A.6	Apply the knowledge of EVs, HEVs and solar vehicles.
402045 B	Operation Research (Ele- II)	C405 B.1	Formulate various management problems and solve using Linear programming using graphical method and simplex method
		C405 B.2	Construct variety of problems such as assignment, transportation, travelling salesman etc. and solve these problems using linear programming approach.
		C405 B.3	Evaluate various situations of Games theory and Sequencing models and apply them to solve them in real life for decision making
		C405 B.4	Plan optimum project schedule for network models arising from a wide range of applications.
		C405 B.5	Select appropriate model for queuing situations and replacement situations and find the optimal solutions using models for different situations
		C405 B.6	Apply the concept of Dynamic and integer programming for arriving at optimal decisions.
402045 C	Energy Audit & Management (Ele-II)	C405 C.1	Awareness about importance of Energy, its conservation, Renewable Energy and energy efficiency in day to day life as well as for future planning.
		C405 C.2	Understand and analyze the Indian and Global Energy Scenario and issues of concern like Climate Change and Energy Security.
		C405 C.3	Carry out Energy Audit of their residence/society/College/Industry where they are studying & training and working
		C405 C.4	Assess the Energy Conservation performance of thermal and electrical utilities
		C405 C.5	Assess the Energy Conservation opportunities using energy economics.
		C405 C.6	Evaluate the energy performance improvement by Cogeneration and WHR method.
402046	Project-I	C406.1	Ability to identify the project that shall benefit through the solution to the society and also demonstrate concern for environment.
		C406.2	Ability to engage in independent study to research literature in the identified domain and to consolidate the literature search to identify and formulate the engineering problem.

		C406.3	Ability to engage in independent study to identify the mathematical concepts, science concepts, engineering concepts, management principles and select the engineering tools/components necessary for solving the identified engineering problem and to arrive at design solution(s).
		C406.4	Ability to prepare the cost estimate and scheduling of the project work and designate responsibility of every member in the team.
		C406.5	Ability to perform in the team, contribute to the team and mentor/lead the team.
		C406.6	Ability to engage in effective oral communication through presentation of the project stage-1 work, demonstration of the project concept, effective written communication through the project stage-1 report.
402047	Energy Engineering	C407.1	Understand the Power Generation Scenarios, components of Thermal power plant and analyze the Rankine & Cogeneration cycle.
		C407.2	Analyze the Steam condenser and recognize the environmental impacts of thermal power plant and methods to control pollution.
		C407.3	Recognize and study the layout, construction & working of hydroelectric and Nuclear power plant.
		C407.4	Understand details of diesel & Gas power plant and able to prepare the layout and analyze gas & diesel power plant.
		C407.5	Study various types of Non-Conventional power plants.
		C407.6	Understand the different power plant instruments and analyze the cost of power generation.
402048	Mechanical System Design	C408.1	Design the multispeed Gear Box for different applications
		C408.2	Apply the statistical considerations in design and analyze the defects and failure modes in components.
		C408.3	Design the material handling systems for the specifications stated/formulated.
		C408.4	Design the pressure vessel for the specifications stated/formulated.
		C408.5	Design the I.C.Engine components for the specifications stated/formulated.
		C408.6	Learn and apply the optimum design principles to mechanical components.
402049 A	Tribology (Elective - III)	C409A.1	Enable student to know the importance of Tribology in Industry
		C409A.2	Enable the students to know the basic concepts of Friction, Wear, Lubrications and their measurements

		C409A.3	Know the performance of different types of bearings and analytical analysis thereof.
		C409A.4	Apply the principles of surface engineering for different applications of tribology
402049 B	Industrial Engineering (Ele III)	C409B.1	Understand and apply the Industrial Engineering concept in industrial environment.
		C409B.2	Demonstrate the recording techniques of method study and identify the appropriate technique for work measurement.
		C409B.3	Analyze and implement different concepts involved in work measurement and understanding of work content in various situations.
		C409B.4	Identify different forecasting techniques and make use of available resources for production and capacity planning.
		C409B.5	Describe different aspects of facilities design and select material handling equipment related to manufacturing and service industries
		C409B.6	To understand and apply Industrial safety standards, financial management practices and Human resource management in organization
402050 A	Advanced Manufacturing Processes (Ele-IV)	C410 A.1	Classify and analyze special forming processes.
		C410 A.2	Analyze and identify applicability of advanced joining processes.
		C410 A.3	Understand and analyze the basic mechanisms of hybrid non-conventional machining techniques
		C410 A.4	Select appropriate micro and nano fabrication techniques for engineering applications
		C410 A.5	Understand and apply various additive manufacturing technology for product development
		C410 A.6	Understand material characterization techniques to analyze effects of chemical composition, composition variation, crystal structure, etc.
402050 C	Product Design & Development (Ele-IV)	C410 C.1	Understand essential factors for product design
		C410 C.2	Design product as per customer needs and satisfaction
		C410 C.3	Understand Processes and concepts during product development
		C410 C.4	Understand methods and processes of Forward and Reverse engineering
		C410 C.5	Carry various design processes as DFA, DFMEA, design for safety
		C410 C.6	Understand the product life cycle and product data management

402051	Project-II	C411.1	Ability to transform the design solution(s) for the identified engineering problem into a full- scale model/prototype/virtual model using CAD tools by following manufacturing process sheets/CAD tool procedure for virtual model creation.
		C411.2	Ability to demonstrate compliance to the prescribed standards/ safety norms through implementation of the identified engineering problem.
		C411.3	Ability to analyze and interpret results of testing and validation of full-scale model/prototype/virtual model and to arrive at valid conclusions.
		C411.4	Ability to perform the optimum utilization resources for project (e.g. cost, power, area, weight, size, etc.)
		C411.5	Ability to abide by the norms of professional ethics.
		C411.6	Ability to engage in effective oral communication through presentation of the project stage-II work, demonstration of the project full-scale model/prototype/virtual model, effective written communication through the project stage-II report, journal publication and the one-page poster presentation of the project work.