AMRUTVAHINI COLLEGE OF ENGINEERING, SANGAMNER

DEPARTMENT OF MECHANICAL ENGINEERING

M.E. DESIGN ENGINEERING (2013 Pattern) Course Outcomes

Course Code	Course Name	Course Outcomes-on the completion of this course student will be able to	
SEMESTER - I			
507201	Advanced Mathematics	CO1	Develop knowledge of numerical methods applicable for mechanical engineering.
		CO2	Formulate and obtain the numerical solution of mechanical engineering problems.
		CO3	Able to compare different numerical schemes.
		CO4	Understand the algorithms of mechanical engineering related software packages.
502202	Material Science and Mechanical Behaviour of Materials	CO1	Summarize ductile and brittle type fractures using different theories.
		CO2	Integrate design considerations in mechanical behaviour of advanced materials.
		CO3	Review strengthening mechanisms of materials and selection of materials
502203	Advanced Stress Analysis	CO1	Solve the problems related to the theory of elasticity.
		CO2	Analyse two dimensional problems in rectangular as well as polar co-ordinates.
		CO3	Find shear centre for various cross section.
		CO4	Determine membrane stresses in shell and storage vessel.
		CO5	Interrupt torsion of bars with various cross sections.
		CO6	Solve problem based on contact stresses.
502104	Research Methodology	CO1	Conduct literature survey by using various research considerations.
		CO2	Formulate the problem statement using research considerations.
		CO3	Demonstrate knowledge and understanding of data analysis in relation to the research process.
		CO4	Interpret the analysis performed in relation to the research process.
502205	**Elective I**		
	Energy Audit & Management	CO1	Compare energy scenario of India and World.
		CO2	Carry out Energy Audit of the Residence / Institute/ Organization.
		CO3	Identify and evaluate energy conservation opportunities in Thermal Utilities.
		CO4	Identify and evaluate energy conservation opportunities in Electrical Utilities.
	Project Management	CO1	Understand the importance of projects and its phases.
		CO2	Analyse projects from marketing, operational and financial perspectives.
		CO3	Evaluate projects based on discount and non-discount methods.

		CO4	Develop network diagrams for planning and execution of a given project.
		CO5	Apply crashing procedures for time and cost optimization
	Intellectual Property Rights	CO1	Appreciate the significance of Intellectual Property as a very important driver of growth and development.
		CO2	Statutorily acquire and use different types of intellectual property in their professional life.
SEMESTER-II			
502207	Analysis and Synthesis of Mechanisms	CO1	Synthesize and analyse four bar mechanisms.
		CO2	Use computers for mechanism animation and analysis.
		CO3	Apply kinematic theories to real-world problems of mechanism design and synthesis.
502208	Advanced Mechanical Vibrations	CO1	Knowledge of fundamentals of Vibrations
		CO2	Considerably more in-depth knowledge of the major subject and ability to solve problems on Two degree freedom system, Multi degree freedom system
		CO3	Knowledge of Experimental Methods in Vibration Analysis.
		CO4	Understand and apply the methodology for dynamic Analysis.
		CO5	Understand Non-Linear Vibrations and Random Vibrations.
502209	Finite Element Method	CO1	Identify the concepts of idealization, discretisation and able to define the boundary conditions.
		CO2	Formulate element and global stiffness matrices.
		CO3	Evaluate results of finite element analysis.
		CO4	Identify sources of computational and physical errors of finite element analysis and its scope applicability.
		CO5	Implement the methodology of finite element analysis and Interpret numerical results.
		CO6	Use commercial finite element analysis software.
502210	**Elective II**		
	Acoustics & Noise Control – I&II	CO1	Knowledge of design for noise and vibration.
		CO2	Knowledge of signal process.
		CO3	Understanding hydrostatic and hydrodynamic lubrication.
		CO4	Understanding of NVH control strategies.
	Process Equipment Design	CO1	Understand the basic concepts in process design, block diagrams for flow of processes, material flow balance, design pressures and temperatures
		CO2	Able to do cost and profitability estimation
		CO3	Able to use optimization technique such as Lagrange's multiplier and golden section method.
		CO4	Able to implement different design codes like IS-2825, ASME-SECT, EIGHT-DIV-II TEMA.API-650, BS-1500 & 1515 in various PED.

SEMESTER-III			
602213	Optimization Techniques	CO1	Develop the ability to obtain the optimal solution for engineering problems.
		CO2	Model engineering problems and pose it as an optimisation problem.
		CO3	Apply the optimisation methods to design a mechanical system.
602214	Mechanical Measurements and Controls	CO1	Classify various types of static characteristics and types of errors occurring in the system.
		CO2	Classify and select proper measuring instrument for linear and angular displacement.
		CO3	Classify and select proper measuring instrument for pressure and temperature measurement.
		CO4	Design mathematical model of system/process for standard input responses.
		CO5	Analyse error and differentiate various types of control systems and time domain specifications.
		CO6	Analyse the problems associated with stability.
602215	**Elective III**		
	Industrial Tribology-I & II	CO1	Understand the role of Tribology in mechanical system design.
		CO2	Understanding of friction and wear phenomenon.
		CO3	Apply the concepts of tribology for design and operations of bearings and lubrication requirements.
		CO4	Insights into performance of Hydrostatic (externally-pressurized) & Elasto-Hydrodynamic Lubrication
		CO5	Knowledge of Rheodynamic (static) Lubrication
	Product Life Cycle	CO1	Understanding of product structure and architecture of the product families and similar products.
		CO2	Integrate lifecycle management strategies and knowledge to develop new and/or formulate appropriate engineering design solutions in engineering environment.
		CO3	Acquired engineering knowledge related to each phase of the life cycle through which the product passes with the usage of integrated software for monitoring and management.
		CO4	Incorporate preventive approaches concentrating on minimizing waste, hazard and risk associated with product design, development and manufacturing.