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Department of Mechanical Engineering

Course Outcomes

Academic Year	Name of Course	Course Code	Course Outcome	
ME (2017 Course)	Advanced Mathematics	507201	CO 507201.1	To apply concept of Inner Products & Orthogonal Projections
			CO 507201.2	To apply concept of Complex Variables & Complex Differentiation
			CO 507201.3	To deal with concept of Transforms & Applications of Transform.
			CO 507201.4	Understand concept of differential equation & its application in Mechanical Engineering.
			CO 507201.5	Understand Concept of boundary value problem, Wave equation & Laplace equation.
			CO 507201.6	Use of various Methods to solve differential equation of higher order.
ME (2017 Course)	Material Science and Mechanical Behavior of Materials	502202	CO1 502202.1	Compare and select modern Materials in Design Engineering for various applications
			CO1 502202.2	Evaluate response of metals and alloys to applied load
			CO1 502202.3	Compute the stress, strain and temperature rise for various tests under complex loading
			CO1 502202.4	Analyze plastic behavior for different loading conditions
			CO1 502202.5	Understand Elastic-Plastic equilibrium under variable loading
			CO1 502202.6	Interpret Elasto-Visco-Plasticity models, rubber elasticity, damping, yielding and effect of strain rate
ME (2017 Course)	Advanced Stress Analysis	502203	CO1 502203.1	Understand the fundamental principles and theories underlying advanced stress analysis techniques.
			CO1 502203.2	Apply mathematical and computational methods to analyze stress and deformation in complex engineering structures.
			CO1 502203.3	Analyze and interpret stress distributions under various loading

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				conditions including static, dynamic, and thermal loads.
			CO1 502203.4	Evaluate the performance and safety of engineering components and structures based on stress analysis results.
			CO1 502203.5	Utilize advanced stress analysis techniques to optimize the design of engineering systems and components for enhanced performance and reliability.
			CO1 502203.6	Demonstrate proficiency in using software tools for finite element analysis (FEA) and other numerical methods for stress analysis.
ME (2017 Course)	Research Methodology	502204	CO1 502204.1	Understand basic concepts of research and its methodologies.
			CO1 502204.2	Select and define appropriate research problem and parameters.
			CO1 502204.3	Understand and apply research approaches, to design mathematical model.
			CO1 502204.4	Able to use instrumentation schemes for data collection and experimental setup.
			CO1 502204.5	Design the use of major experimental methods for research.
			CO1 502204.6	Write a research report and thesis.
ME (2017 Course)	"Elective I ME2I – M4 Project Management"	502205	CO1 502205.1	Ability to define project objectives, requirements, and constraints clearly.
			CO1 502205.2	To study the various aspects of project management, including technical design, financing, contracting, implementation, performance monitoring, and measurement and verification.
	Elective I ME2I – M6 Operation Management		CO1 502205.3	Understanding the importance and fundamentals of operation management, including operating system models and key decision-making processes.
			CO1 502205.4	Proficiency in strategic planning and control methods, incorporating technology and knowledge management for effective operations.

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			CO1 502205.5	Knowledge of supply chain and network approaches, as well as strategies for quality management and risk mitigation.
			CO1 502205.6	Awareness of challenges, opportunities, and methods for achieving operational excellence and sustainability, illustrated through relevant case studies.
	Elective I ME1I – M11 Environmental Pollution and Control		CO1 502205.7	To Study the Environmental and Pollution control ethics, regulation for mobiles and its hazardous and economic impact.
ME (2017 Course)	Analysis and Synthesis of Mechanisms	502207	CO1 502207.1	Examine the fundamentals of kinematics to compute velocity and acceleration analysis of simple mechanisms
			CO1 502207.2	Analyze velocity-acceleration of complex mechanisms by the Normal Acceleration method and Auxiliary Point Method
			CO1 502207.3	Understand Curvature theory with the help of Euler-Savary equation, Bobillier constructions and cubic of stationary curvature
			CO1 502207.4	Synthesize the mechanism for function generation and rigid body guidance using Relative pole method & Inversion method
			CO1 502207.5	Synthesis planar mechanisms for four accuracy points using different methods
			CO1 502207.6	Analyze kinematics of Spatial Mechanisms using matrix method and Denavit-Hartenberg parameters
ME (2017 Course)	Advanced Mechanical Vibrations	502208	CO1 502208.1	Understanding of Vibrational Systems: Students will gain a deep understanding of mechanical vibration concepts.
			CO1 502208.2	Analysis and Prediction of Vibration Characteristics: Students will be able to analyze and predict the characteristics of mechanical vibrations.

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			CO1 502208.3	Application of Advanced Vibration Analysis Techniques: Through hands-on exercises and projects.
			CO1 502208.4	Design and Optimization for Vibration Control: Students will learn techniques for designing and optimizing mechanical systems to control and mitigate vibration effects.
			CO1 502208.5	Assessment of Vibrational Effects on Structural Integrity: Students will understand the impact of mechanical vibrations on the structural integrity of engineering components and systems
			CO1 502208.6	Integration of Vibration Analysis with Engineering Design: Students will integrate vibration analysis methodologies into the engineering design process.
ME (2017 Course)	Finite Element Method	502209	CO1 502209.1	Derive and use 1-D and 2-D element stiffness matrices and load vectors from various methods to solve for displacements and stresses.
			CO1 502209.2	Apply mechanics of materials and machine design topics to provide preliminary results used for testing the reasonableness of finite element results.
			CO1 502209.3	Explain the inner workings of a finite element code for linear stress, displacement, temperature and modal analysis.
			CO1 502209.4	Use professional-level finite element software to solve engineering problems in solid Mechanics
			CO1 502209.5	Interpret the results of finite element analyses and make an assessment of the results in terms of modeling (physics assumptions) errors, discretization (mesh density and refinement toward convergence) errors, and numerical (round-off) errors.
			CO1 502209.6	Solve real life mechanical engineering problems

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ME (2017 Course)	Elective II DE2II-M5 Mechanics of Composites	502210	CO1 502210.1	To study types, benefits and application of Composite Materials
			CO1 502210.2	To study Mechanical behavior of Lamina of composite materials
			CO1 502210.3	To study Mechanical behavior of Laminate composite materials
	Elective II DE2II-M7 Acoustics and Noise Control - I		CO1 502210..4	Study the Basics concepts of acoustics and its measurement technics.
			CO1 502210.5	To study Transmission of sound with various variable equations.
			CO1 502210.6	To study Acoustic Criteria related to human beings.
	Elective II DE2II-M12 Robotics		CO1 502210.7	To study basic concept of Manipulator Kinematics
			CO1 502210.8	To study Robotics Dynamics
			CO1 502210.9	To study and Apply Trajectory Planning
ME (2017 Course)	Optimization Techniques	502213	CO1 502213.1	Formulate Linear Programming Problems (LPP) for constrained and unconstrained optimization.
			CO1 502213.2	Solve nonlinear single variable optimization problems where objective function and/or constraints are not stated as explicit functions of the design variables or are complicated to manipulate.
			CO1 502213.3	Optimize nonlinear multivariable and constrained optimization problems where objective function and/or constraints are not stated as explicit functions of the design variables.
			CO1 502213.4	Use modern methods of optimization to solve nonlinear single variable and multivariable optimization problems where objective function are complicated to manipulate.
			CO1 502213.5	Aware of nontraditional methods of optimization to optimize nonlinear single variable and multivariable optimization problems.
			CO1 502213.6	Formulate Linear Programming Problems (LPP) for constrained and unconstrained optimization.

ME (2017 Course)	Mechanical Measurements and Controls	502214	CO1 502214.1	To study the fundamental principles behind measurement techniques used in mechanical engineering, including concepts like accuracy, precision, calibration, and error analysis.
			CO1 502214.2	To study Fundamentals of interfacing of sensors with Microcontroller/computer
			CO1 502214.3	To study mathematical Modelling of Mechatronics Systems.
			CO1 502214.4	To study and plot Transient response of electromechanical and mechanical system using time domain.
			CO1 502214.5	To study and plot Transient response of electromechanical and mechanical system using frequency domain.
ME (2017 Course)	Elective III DE2III-M7 Industrial Tribology – I"	502215	CO1 502215.1	To apply the design concept in surface friction, wear and lubrications about frictional behavior.
			CO1 502215.2	To know about properties of lubricants, modes of lubrication, additives etc.
			CO1 502215.3	To study the design concept in hydrostatic lubrications.
	Elective III DE2III-M8 Industrial Tribology – II		CO1 502215.4	To study the design concept in elasto-hydrodynamic lubrications.
			CO1 502215.5	To study hydrostatic, hydrodynamic and thrust bearings with air lubrication
			CO1 502215.6	To study Tribological aspects of rolling motion.
	Elective III DE1III-M9 - Reliability Engineering		CO1 502215.7	To study, Design and Analyse different techniques of ANOVA, factorial design and regression Analysis of various manufacturing products.