VARDHAMAN COLLEGE OF ENGINEERING, HYDERABAD

Autonomous institute affiliated to JNTUH

DEPARTMENT OF Mechanical Engineering

M. TECH – Engineering Design

Course outcomes:

Course Title with Code	#	Statement
Advanced Mechanics of Solids B4701	CO1	Remember and understand the concepts of mechanics of solids and its application to the behavior of structures (shear centre, curved beam, unsymmetrical bending) at different loading conditions.
	CO2	Investigate the response of beam structure on elastic foundation
	CO3	Examine the torsion problems with linear elastic solution of non-circular cross section and explain with different analogies.
	CO4	Explain the responses of structures on elastic foundation various end conditions and evaluate at different loading scenarios.
	CO5	Analyze the influences of contact stress induced in structures.
Analysis and synthesis of Mechanisms B4702	CO1	Understand the kinematic theories to real-world problems of mechanical design.
	CO2	Apply the graphical and analytical techniques commonly used in the synthesis of mechanisms.
	CO3	Formulate and solve numerical problems of analysis and synthesis of mechanisms.
	CO4	Explain the theory and methodologies employed for design of mechanisms.
	CO5	Synthesize mechanisms with 3 and 4 accuracy points.
Mechanics of Composite Materials B4753	CO1	Explain the significance and objectives of Composite Materials
	CO2	Apply the basic concepts and characteristics of Composite Materials
	CO3	Analyze the elastic behavior of unidirectional lamina
	CO4	Solve the mechanical strength parameters of unidirectional lamina
	CO5	Estimate the elastic behavior, stress and failure analysis of laminate
Tribology B4755	CO1	Understand the nature of engineering surfaces, concepts of friction, wear and lubrication
	CO2	Explain the different bearing Materials with their properties
	CO3	Apply the basic theories of friction, wear and lubrication to predictions about the frictional behavior of commonly encountered sliding interfaces.
	CO4	Identify, Analyze and solve the Tribo-logical problems by using laws of friction, wear and lubrication
Advanced Computer Aided Modeling Lab B4703	CO1	Illustrate the solid modeling in modern solid packages like CATIA
	CO2	Build the MATLAB codes for the CAD applications
	CO3	Develop the Analytical and Syntheic curves using Matlab
	CO4	Utilize the advanced modeling tools for product development

	CO5	Judge the detailed drawings and bill of materials
Kinematics and Dynamics Lab B4704	CO1	Analyze the characteristics curves of different types of Governors.
	CO2	Examine the balancing conditions of rotating and reciprocating systems.
	CO3	Determine the active and reactive Gyroscope couples.
	CO4	Evaluate the natural frequency of single rotor system with viscous damping and amplitude of a vibrating system.
	CO5	Analyze the direct and inverse mechanism of robot.
Finite Element Analysis B4705	CO1	Outline the basic concepts of finite element analysis
	CO2	Choose the finite element formuation
	CO3	Develop shape function of different element under different bounary conditions
	CO4	Analyze the axisymmetric problems
	CO5	Estimate the eigen values and eigen vector for bar and beam elements
Computer Aided Design B4706	CO1	Define the CAD Hardware and computer communications
	CO2	Expalin the concepts of Computer Graphics
	CO3	Apply the principals of Geometric Modeling
	CO4	Analyze the fundamentals of Solid Modeling and its applications
	CO5	Distinguish the need of simulation and finite element anlysis applications
Advanced Machine Design B4757	CO1	Understand the concept generation, evaluation and testing.
	CO2	Identify important processes in product development in an organization.
	CO3	Apply various techniques of Rapid Prototyping in order to shorter product development time.
	CO4	Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, ethical, health and safety, manufacturability, and sustainability.
	CO5	Creatively explore strategies to conceptualize and generate original and relevant solutions to design problems.
Mechanical Vibrations B4760	CO1	Understand the causes and effects of vibration in mechanical systems and its effects on various systems.
	CO2	Develop the mathematical modeling of structure with schematic models.
	CO3	Determine the dynamic response of system using different computational approaches.
	CO4	Implement the approximate and iterative techniques to form the continuous vibratory systems.
	CO5	Analyze the mechanism of rotating components and measure the responses of different vibrating structures.
Numerical Methods and Analysis Lab B4707	CO1	Demonstrate the applications of Numerical Methods
	CO2	Solve the two dimensional problems
	CO3	Analyze the mode shape and frequencies of a beam under different boundary conditions

	CO4	Estimate the temperature distribution of heat transfer problems
	CO5	Identify the harmonic response of a 2D component
Advanced Design Lab B4708	CO1	Determine the deflection, shear centre, whirling speed and stress of different structures.
	CO2	Analyze the transverse vibration of different beam set up.
	CO3	Evaluate the compressive, tensile and buckling strength of 3-D printed structures.
	CO4	Estimate the natural frequency of dynamic system using FFT analyzer and its application to fault detection.
	CO5	Explore the natural frequencies and mode shapes of mechanical components using spectrum analysis concepts.
Fracture, Fatigue and Creep B4756	CO1	Understand the concepts of fracture, fatigue and creep behavior of structure and emphasize the significance of material properties.
	CO2	Explore the behavior of cracks using liner elastic fracture mechanics concepts.
	CO3	Investigate the influence of fracture parameters on failure prediction.
	CO4	Examine the micro mechanisms of brittle and ductile fracture
	CO5	Apply the acquaintance for failure analysis with case studies
Design for Manufacturing B4765	CO1	Select the suitable material for manufacturing of different machine parts
	CO2	Apply the concept of design and generate numerical solutions for different manufacturing process
	CO3	Examine different case studies and write conclusions regarding the observations
	CO4	Design different elements considering the properties of materials
	CO5	Improve the properties of materials by adopting best methods for designing of machine members