Koneru Lakshmaiah Education Foundation

(Category -1, Deemed to be University estd. u/s. 3 of the UGC Act, 1956)

Accredited by **NAAC** as 'A++' ❖Approved by AICTE ❖ ISO 21001:2018 Certified

Campus: Green Fields, Vaddeswaram - 522 302, Guntur District, Andhra Pradesh, INDIA.

Phone No. +91 8645 - 350 200; www.klef.ac.in; www.klef.edu.in; www.kluniversity.in

Admin Off: 29-36-38, Museum Road, Governorpet, Vijayawada - 520 002. Ph: +91 - 866 - 3500122, 2576129

Department of Mechanical Engineering

Program: M.Tech-Machine Design

Academic Year :2022-2023

S.No	Course Code	Course Title	Co No.	Course Outcome Description
1	22ME5117	DESIGN METHODS	CO1	Understand Phases of design and associated requisites
			CO2	Understand Types of design and modelling of the problems
			CO3	Understand Material and manufacturing considerations
			CO4	Understand Reliability of design and quality concepts
2	22ME5118	DESIGN WITH ADVANCED MATERIALS	CO1	Understand the properties of Ferrous and Non ferrous materials for suitable applications.
			CO2	Understand mechanical behavior of the polymer materials and ceramics for engineering applications.
			CO3	Design composites, Functionally graded materials and smart materials for advanced applications.
			CO4	Design with intermetallic, super alloys and Nano materials to develop a suitable product.
3	22ME5119	THEORY OF ELASTICITY AND PLASTICITY	CO1	Understand the significance of compatibility and equilibrium equations. Evaluation of factor of safety against yielding in multi-axial stress state.
			CO2	Solve 2-D elasticity problems in Cartesian and Polar coordinate systems
			CO3	Analyze the bending of cantilever beams having rectangular and circular cross sections; Axisymmetric stress and deformation in a solid of revolution; and simple 3-D stress analysis problems
			CO4	Understand plastic deformation and plastic yielding. Solving problems using the characteristic methods and engineering methods.
4	22ME5120	MODELING AND ANLALYSIS – I (CAD)	CO1	To understand various evaluation criteria for CAD/CAM system and need of graphics standard
			CO2	To represent different curves and surfaces of geometric models mathematically.
			CO3	To represent solid models using different solid represent schemes

Head, Department of Mechanical Engineering

K L (Deemed to be University)

Vaddeswaram-522502

			CO4	To recognize and apply various data exchange formats in geometric modeling and also will be able to apply finite element modeling and mechanical assembly concepts in design applications
			CO5	To apply concepts of geometric modeling in designing using CAD tools
5	22ME5221	MECHANICAL VIBRATIONS	CO1	Analyze the behavior of single degree of freedom undamped and damped free vibrations using basic principles.
			CO2	Analyze the behavior of single degree of freedom damped forced vibrations using basic principles
			CO3	Analyze the behavior of two degree of freedom and multi-degree of freedom
			CO4	Analyze the shafts for critical speeds as well as analysis of transient vibrations based on Laplace transform approach.
6	22ME5222	DESIGN FOR OPTIMIZATION	CO1	Understanding the basic principles of optimizations and applying various design constraints for solving optimization problems.
			CO2	Applying various optimization techniques for solving real time applications through MATLAB and Python programming
			CO3	Designing of various structural applications by considering static conditions.
			CO4	Designing of various structural applications by considering dynamic conditions.
7	22ME5223	ADVANCED STRENGTH OF MATERIALS	CO1	Analyze the stresses and deflections in the beams under unsymmetrical bending and determination of shear center.
			CO2	Analyze the stresses induced in curved beams subjected to loading.
			CO3	Analyze the torsional stresses in beams and determine the contact stresses.
			CO4	Apply principles of elasticity to determine stresses in two-dimensional and three-dimensional problems.
8	22ME5224	MODELING AND ANALYSIS-2 (ADVANCED FEM)	CO1	Apply finite element method to solve problems in Bending of plates and shells and Conforming and Non- Conforming elements.
			CO2	Formulate and solve the Non-Linear problems in - Elastic Plasticity and Large displacement formulation.
			CO3	Formulate the Dynamic Problems in free, transient, and forced vibration.
			CO4	Interpret and evaluate the quality of fluid mechanics and heat transfer and error estimates and adaptive refinement.
			CO5	Gain hands on experience in converting a given structure into desired shape and size by applying suitable ANSYS APDL software.
			CO1	Understand and apply the measuring tools to machines and instruments.

9	22ME51I1	PRECISION AND QUALITY ENGINEERING	CO2	Understand the different methods and solve the problems of Quality control.
			CO3	Relate the Quality and Reliability and its associated failure modes.
			CO4	Understand and implement the ISO 9000 series of total quality management.
10	22ME51I2	ADVANCED MECHANISMS	CO1	Develop the concepts of different types of mechanism with the mobility and motion parameters along with their application in kinematic analysis
			CO2	Analyze the coupler motion of links by analytical and graphical method.
			CO3	Apply different method to evaluate the path generation of four bar Mechanism.
			CO4	Analyze the Kinematic mechanism using ADAMs and different application of R0B0T by D-H notation by contrast with forward and inverse kinematics
11	22ME51I3	CONCURRENT ENGINEERING	CO1	Understand the benefits of Concurrent Engineering and solve the relevant problems.
			CO2	Understand the concurrent engineering organization and its Philosophies.
			CO3	Understand the System engineering and its Complexity
			CO4	Understand the Conventional Design and Development Process.
12	22ME51J1	DESIGN OF PRESSURE VESSELS AND PLATES	CO1	Analyze stresses in cylindrical shells and its components
			CO2	Design pressure vessel under various pressure loads
			CO3	Formulate basic equations for bending of plate
			CO4	Analyze bending of circular plate
13	22ME51J2	TRIBOLOGICAL SYSTEM DESIGN	CO1	Understand the surface wear and its treatment
			CO2	Analyze the lubricant flow and delivery in different bearings.
			CO3	Understand the rolling bearings and its failure criterion.
			CO4	Understand the tools to measure the bearing performance.
14	22ME51J3	PRODUCT DESIGN & DEVELOPMENT	CO1	Understand the Product lifecycle management
			CO2	Understand the product design and development.
			CO3	Understand the customer needs to establish the engineering specifications.
			CO4	Understand and apply the rapid prototyping technique.
15	22ME52K1	MECHANICS OF COMPOSITE MATERIALS	CO1	Understand the micromechanics of Composites.
			CO2	Understand the mechanical properties of composites and its characterization.
			CO3	Understand the Macro-mechanics of Composite lamina.
			CO4	Understand the strength of Unidirectional lamina and apply the failure theories to determine the strength of composite lamina.
			CO1	Understand the design of machine tools and its manufacturing.

16	22ME52K2	MACHINE TOOL DESIGN	CO2	Design the machine tool structures and speed & feed rate regulation.
			CO3	Design the machine tools beds and guide ways.
			CO4	Understand numerical control of machine tools.
17	22ME52K3	FRACTURE MECHANICS	CO1	Understand Crack growth and fracture mechanics
			CO2	Development of stress field equations in fracture mechanics
			CO3	Know the various methods for evaluating stress intensity factors
			CO4	Understand how to perform fracture toughness testing and crack growth phenomenon
18	22ME52L1	ENGINEERING NOISE AND CONTROL	CO1	Understand the Noise-Control Strategies.
			CO2	Understand and apply the instruments for noise measurement and analysis
			CO3	Understand the harmful effects of Noise.
			CO4	Understand and estimate the Noise of Noise associated devices and their control.
19	22ME52L2	ENGINEERING FAILURE ANALYSIS AND PREVENTION	CO1	Familiarizing with failure causes and analysis
			CO2	Understanding Different types of failures.
			CO3	Exploring Failure problems during processing
			CO4	Reviewing Case studies
20	22ME52L3	DESIGN FOR MANUFACTURING, ASSEMBLY AND ENVIRONMENT	CO1	Understand the manufacturability and form design.
			CO2	Design and assemble machined components.
			CO3	Identify uneconomical design and redesign the cast components.
			CO4	Understand different methods for design for the environment.

Professor I/C Academics

HOD-ME

Head, Department of Mechanical Eng:
K L (Deemed to be University)
Vaddeswaram-522502