TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES

(21MAT31)

1. Course Outcomes

CO Number	Course Outcome **At the end of the course, student should be able to . . .**	Blooms' Level
CO1	To solve ordinary differential equations using Laplace transform.	L1, L2, L3
CO2	Demonstrate the Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.	L1, L2, L3
CO3	To use Fourier transforms to analyze problems involving continuous-time signals and to apply Z-Transform techniques to solve difference equations.	L1, L2, L3
CO4	To solve mathematical models represented by initial or boundary value problems involving partial differential equations.	L1, L2, L3
CO5	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.	L1, L2, L3

METAL CASTING FORMING & JOINING PROCESS (IPCC)

(21ME32)

1. Course Outcomes

CO Number	Course Outcome **At the end of the course, student should be able to . . .**	Blooms' Level
CO1	Select appropriate primary manufacturing process and related parameters for obtaining initial shape and size of Components.	L1 & L2
CO2	Design and develop adequate tooling linked with casting, welding and forming operations.	L1 & L2
CO3	Appreciate the effect of process parameters on quality of manufactured components.	L1 & L2
CO4	Demonstrate various skills in preparation of molding sand for conducting tensile, shear and compression tests using Universal sand testing machine.	L1 & L2
CO5	Demonstrate skills in preparation of forging models involving upsetting, drawing and bending operations. Demonstrate skills in preparation of Welding models.	L1 & L2

MATERIAL SCIENCE AND ENGINEERING (IPCC)

(21ME33)

1. Course Outcomes

CO Number	Course Outcome **At the end of the course, student should be able to . . .**	Blooms' Level
CO1	Understand the atomic arrangement in crystalline materials and describe the periodic arrangement of atoms in terms of unit cell parameters.	L1 & L2
CO2	Understand the importance of phase diagrams and the phase transformations.	L1 & L2
CO3	Know various heat treatment methods for controlling the microstructure.	L1 & L2
CO4	Correlate between material properties with component design and identify various kinds of defects.	L1 & L2
CO5	Apply the method of materials selection, material data and knowledge sources for computer-aided selection of materials.	L1 & L2

THERMODYNAMICS

(21ME34)

1. Course Outcomes

CO Number	Course Outcome **At the end of the course, student should be able to . . .**	Blooms' Level
CO1	Describe the fundamental concepts and principles of engineering thermodynamics.	L1, L2, L3
CO2	Apply the governing laws of thermodynamics for different engineering applications.	L1, L2, L3
CO3	Analyse the various thermodynamic processes, cycles and results.	L1, L2, L3
CO4	Interpret and relate the impact of thermal engineering practices to real life problems.	L1, L2, L3

COMPLEX ANALYSIS, PROBABILITY AND LINEAR PROGRAMMING

(21MATME41)

1. Course Outcomes

CO Number	Course Outcome **At the end of the course, student should be able to . . .**	Blooms' Level
CO1	Use the concepts of an analytic function and complex potentials to solve the problems arising in fluid flow.	L1, L2, L3
CO2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.	L1, L2, L3
CO3	Apply discrete and continuous probability distributions in analyzing the probability models arising in the engineering field.	L1, L2, L3
CO4	Analyze and solve linear programming models of real-life situations and solve LPP by the simplex method.	L1, L2, L3
CO5	Learn techniques to solve Transportation and Assignment problems.	L1, L2, L3

MACHINING SCIENCE AND JIGS & FIXTURES (IPCC)

(21ME42)

1. Course Outcomes

CO Number	Course Outcome **At the end of the course, student should be able to . . .**	Blooms' Level
CO1	Demonstrate the Conventional CNC machines and advanced manufacturing process operations	L1 & L2
CO2	Determine tool life, cutting force, and economy of the machining process.	L1 & L2
CO3	Analyze the influence of various parameters on machine tools' performance.	L1 & L2
CO4	Select the appropriate machine tools and process, the Jigs, and fixtures for various applications.	L1 & L2

FLUID MECHANICS (IPCC)

(21ME43)

1. Course Outcomes

CO Number	Course Outcome **At the end of the course, student should be able to . . .**	Blooms' Level
CO1	Understand the basic principles of fluid mechanics and fluid kinematics	L1, L2, L3
CO2	Acquire the basic knowledge of fluid dynamics and flow measuring instruments	L1, L2, L3
CO3	Understand the nature of flow and flow over bodies and the dimensionless analysis	L1, L2, L3
CO4	Acquire the compressible flow fundamental and basics of CFD packages and the need for CFD analysis.	L1, L2, L3
CO5	Conduct basic experiments of fluid mechanics and understand the experimental uncertainties.	L1, L2, L3

MECHANICS OF MATERIALS

(21ME44)

1. Course Outcomes

CO Number	Course Outcome **At the end of the course, student should be able to . . .**	Blooms' Level
CO1	Understand simple, compound, thermal stresses and strains their relations and strain energy.	L1, L2, L3
CO2	Analyse structural members for stresses, strains and deformations.	L1, L2, L3
CO3	Analyse the structural members subjected to bending and shear loads.	L1, L2, L3
CO4	Analyse shafts subjected to twisting loads.	L1, L2, L3
CO5	Analyse the short columns for stability.	L1, L2, L3

THEORY OF MACHINES

(21ME51)

1. Course Outcomes

CO Number	Course Outcome **At the end of the course, student should be able to . . .**	Blooms' Level
CO1	Knowledge of mechanisms and their motion and the inversions of mechanisms	L1, L2, L3
CO2	Analyse the velocity, acceleration of links and joints of mechanisms.	L1, L2, L3
CO3	Analyse the mechanisms for static and dynamic equilibrium.	L1, L2, L3
CO4	Carry out the balancing of rotating and reciprocating masses	L1, L2, L3
CO5	Analyse different types of governors used in real life situation and free and forced vibration phenomenon.	L1, L2, L3

THERMO-FLUIDS ENGINEERING (IPCC)

(21ME52)

1. Course Outcomes

CO Number	Course Outcome **At the end of the course, student should be able to . . .**	Blooms' Level
CO1	Apply the concepts of testing of I. C. Engines and evaluate their performance, and evaluate the performance of Reciprocating compressor.	L1 & L2
CO2	Apply and analyse the concepts related to Refrigeration and Air conditioning, and get conversant with Psychrometric Charts, Psychrometric processes, human comfort conditions	L1 & L2
CO3	Explain the construction, classification and working principle of the Turbo machines and apply of Euler's turbine equation to evaluate the energy transfer and other related parameters. Compare and evaluate the performance of positive displacement pumps.	L1 & L2
CO4	Classify, explain and analyse the various types of hydraulic turbines and centrifugal pumps.	L1 & L2
CO5	Classify, explain and analyse various types of steam turbines and centrifugal compressor.	L1 & L2

FINITE ELEMENT ANALYSIS

(21ME53)

1. Course Outcomes

CO Number	Course Outcome **At the end of the course, student should be able to . . .**	Blooms' Level
CO1	Identify the application and characteristics of FEA elements such as bars, beams, plane and iso parametric elements.	L1 & L2
CO2	Develop element characteristic equation and generation of global equation.	L1 & L2
CO3	Formulate and solve Axi-symmetric and heat transfer problems.	L1 & L2
CO4	Apply suitable boundary conditions to a global equation for bars, trusses, beams, circular shafts, heat transfer, fluid flow, axi-symmetric and dynamic problems.	L1 & L2

MODERN MOBILITY AND AUTOMOTIVE MECHANICS

(21ME54)

1. Course Outcomes

CO Number	Course Outcome **At the end of the course, student should be able to . . .**	Blooms' Level
CO1	Understand the working of different systems employed in automobile.	L1, L2, L3
CO2	Analyse the limitation of present day automobiles.	L1, L2, L3
CO3	Evaluate the energy sources suitability.	L1, L2, L3
CO4	Apply the knowledge for selection of automobiles based on their suitability.	L1, L2, L3

PRODUCTION AND OPERATIONS MANAGEMENT

(21ME61)

1. Course Outcomes

CO Number	Course Outcome **At the end of the course, student should be able to . . .**	Blooms' Level
CO1	Apply the necessary tools for decision making in operations management.	L1, L2, L3
CO2	Examine various approaches for forecasting the sales demand for an organization.	L1, L2, L3
CO3	List various capacity and location plans to determine the suitable capacity required for meeting the forecast demand of an organization.	L1, L2, L3
CO4	Analyse the aggregate plan and master production schedule for an organization, given its periodic demand.	L1, L2, L3
CO5	Apply MRP, purchasing and SCM techniques into practice.	L1, L2, L3

HEAT TRANSFER (IPCC)

(21ME62)

1. Course Outcomes

CO Number	Course Outcome **At the end of the course, student should be able to . . .**	Blooms' Level
CO1	Solve steady state heat transfer problems in conduction.	L1 & L2
CO2	Solve transient heat transfer problems.	L1 & L2
CO3	solve convection heat transfer problems using correlations.	L1 & L2
CO4	Solve radiation heat transfer problems.	L1 & L2
CO5	Explain the mechanisms of boiling and condensation and Determine performance parameters of heat exchangers.	L1 & L2

MACHINE DESIGN

(21ME63)

1. Course Outcomes

CO Number	Course Outcome **At the end of the course, student should be able to . . .**	Blooms' Level
CO1	Apply codes and standards in the design of machine elements and select an element based on the Manufacturer's catalogue.	L1, L2, L3
CO2	Analyse the performance and failure modes of mechanical components subjected to combined loading and fatigue loading using the concepts of theories of failure.	L1, L2, L3
CO3	Demonstrate the application of engineering design tools to the design of machine components like shafts, springs, couplings, fasteners, welded and riveted joints, brakes and clutches.	L1, L2, L3
CO4	Design different types of gears and simple gear boxes for relevant applications.	L1, L2, L3
CO5	Apply design concepts of hydrodynamic bearings for different applications and select Anti friction bearings for different applications using the manufacturers, catalogue.	L1, L2, L3

AUTONOMOUS VEHICLES

(21ME643)

1. Course Outcomes

CO Number	Course Outcome **At the end of the course, student should be able to . . .**	Blooms' Level
CO1	Describe the evolution of Automotive Electronics and the operation of ECUs.	L1, L2
CO2	Compare the different type of sensing mechanisms involved in Autonomous Vehicles.	L1, L2
CO3	Discuss about the use of computer vision and learning algorithms in vehicles.	L1, L2
CO4	Summarize the aspects of connectivity fundamentals existing in a driverless car.	L1, L2
CO5	Identify the different levels of automation involved in an Autonomous Vehicle.	L1, L2
CO6	Outline the various controllers employed in vehicle actuation.	L1, L2

RENEWABLE ENERGY POWERPLANTS

(21ME652)

1. Course Outcomes

CO Number	Course Outcome **At the end of the course, student should be able to . . .**	Blooms' Level
CO1	Describe the various forms of non-conventional energy resources.	L1, L2
CO2	Apply the fundamental knowledge of mechanical engineering to design various renewable energy systems.	L1, L2
CO3	Analyze the implications of renewable energy forms for selecting an appropriate system for a specific application.	L1, L2
CO4	Discuss on the environmental aspects and impact of non-conventional energy resources, in comparison with various conventional energy systems, their prospects and limitations.	L1, L2