



# 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  
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Department of Mechanical Engineering

Program: M.Tech-Thermal Engineering

Academic Year :2022-2023

S.No	Course Code	Course Title	Co No.	Course Outcome Description
1	22ME5109	NUMERICAL METHODS IN THERMAL ENGINEERING	CO1	Apply mathematical knowledge in Solving an algebraic or transcendental equation, linear system of equations
			CO2	Apply knowledge of differential equations in appropriate numerical method. Solving the initial boundary value problems and boundary value problems using finite
			CO3	Apply knowledge of finite element methods in selection of appropriate numerical methods to solve various types of problems
			CO4	Apply knowledge of engineering and science in consideration the minimum number of mathematical operations involved, accuracy requirements and available computational resources.
2	22ME5110	ADVANCED THERMODYNAMICS	CO1	Apply thermodynamics concepts for various applications like availability analysis and thermodynamic relations
			CO2	Analyze Phase transition, types of equilibrium and stability, multi component and multi-phase systems, equations of state. Chemical thermodynamics, combustion. Third law of thermodynamics
			CO3	Analyze the basic concepts of Statistical and Irreversible thermodynamics.
			CO4	Analyze the behavior of real gas behavior, availability analysis, statistical and irreversible thermodynamics
3	22ME5111	DESIGN OF THERMAL SYSTEMS	CO1	Apply the modelling concepts to the design of thermal systems
			CO2	Analyze the design of thermal systems by considering its economic viability
			CO3	Analyze about the problem formulation for optimization and its search methods and understanding Lagrange multiplier


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			CO4	Examine about Geometric, linear and dynamic Programming and modeling of thermal equipment
4	22ME5112	ADVANCED HEAT AND MASS TRANSFER	CO1	Apply the fundamentals of heat transfer concepts to different surfaces-fins, pipe flows etc.
			CO2	Apply numerical methods to solve heat transfer problems
			CO3	Analyze the heat transfer through phase change processes
			CO4	Apply the combined heat and mass transfer concepts to different mechanisms in engine applications
5	22ME51E1	HEAT EXCHANGER DESIGN	CO1	Apply heat transfer and fluid flow principles to understand the thermos hydraulic fundamentals of heat exchangers
			CO2	Apply LMTD and $\epsilon$ -NTU methods for the design of different types of shell and tube heat exchangers
			CO3	ply different methods in the design of shell and tube heat exchangers
			CO4	Design of Compact heat exchangers and study of fouling control techniques
6	22ME51E2	CONVECTION AND TWO-PHASE FLOW	CO1	Apply the knowledge of fluid mechanics and heat transfer to understand the two-phase flow phenomena
			CO2	Apply the first order and second order differential equations technique to problems involving two-phase flow
			CO3	Analyze the convection heat transfer problems with solutions involving partial differential equations
			CO4	Synthesize the complex engineering problems by applying the fundamentals of heat transfer and fluid flow
7	22ME51E3	COMPACT HEAT EXCHANGERS	CO1	Apply the principles of heat transfer principles to study the compact heat exchangers
			CO2	Analyze the compact heat exchanger by using basic heat exchanger analysis theory
			CO3	ply the principles of heat transfer to analyze the performance of compact recuperators
			CO4	Analyze the performance of plate heat exchanger, heat pipe heat exchanger and understand the application of compact heat exchanger in multiphase flow applications
8	22ME51F1	ENGINE SYSTEMS AND PERFORMANCE	CO1	Understand the construction and operation of various IC Engines
			CO2	Analyze the role of fuel in engine combustion, and understand the basic combustion chamber design
			CO3	Analyze the effect of turbo charging on the performance of the IC engine
			CO4	Analyze the effect of various design parameters on the performance and emissions of IC engine



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9	22ME51F2	IC ENGINE COMBUSTION AND POLLUTION	CO1	Analyze the role of fuel in engine combustion, and understand the basic combustion process in SI and CI engine
			CO2	Analyze the combustion process in engines and understand the working of various instrumentation used in IC engines
			CO3	Analyze the effect of various pollution control techniques to reduce engine emissions
			CO4	Analyze the performance of various instruments used in the measurement and control of pollution and emissions
10	22ME51F3	ALTERNATIVE FUELS	CO1	Analyze the properties of various alternative fuels to select the appropriate fuel for IC engine
			CO2	Analyze the various methods involved in the production of alternative fuels
			CO3	Analyze the use of gaseous fuels for IC engines
			CO4	Examine the different approaches like dual fuel combustion and use of additives to improve the performance of IC engines
11	22ME5213	INCOMPRESSIBLE AND COMPRESSIBLE FLUID FLOWS	CO1	Apply the laws of fluid flow for ideal and viscous fluids
			CO2	Analyze various solid shapes by suitable flow patterns for aerodynamic applications
			CO3	Analyze the changes in properties of compressible flow and shock expansion
			CO4	Apply the concepts of ideal flow, viscous flow and boundary layer to compressible flow and shock expansion
12	22ME5214	COMPUTATIONAL FLUID DYNAMICS	CO1	Apply various discretization techniques for solving complex problems in the fields of fluid flow and heat transfer
			CO2	Develop finite volume discretized forms of the CFD equations
			CO3	Simulate explicit & implicit algorithms for solving the Euler Equations & Navier Stokes Equations
			CO4	Apply concept of CFD to analyze flow in thermal systems
13	22ME5215	REFRIGERATION AND CRYOGENICS	CO1	Apply the concepts of thermodynamics to analyze refrigeration cycles
			CO2	Analyze various methods to produce low temperatures and understand the application of cryogenics in the industry
			CO3	Analyze the properties of super conductors by various theories
			CO4	Analyze various methods involved in the handling of cryogenics
			CO1	Apply scientific and engineering methods for the measurement of field and derived quantities
			CO2	Analyze principles of presentation, estimation and data analysis

  
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14	22ME5216	MEASUREMENTS IN THERMAL ENGINEERING	CO3	ply various experimental measurement techniques for the measurement of field quantities with probe and non-instructive techniques
			CO4	Evaluate the measurement of derived quantities and analytical methods and design and conduct the experiments, as well as to organize, analyze and interpret data to produce meaningful conclusions and recommendations
15	22ME52G1	PRINCIPLES OF TURBO MACHINERY	CO1	Analyze the design principles of turbomachinery to improve and optimize its performance
			CO2	sign and analyses the performance of Turbo machines for engineering applications
			CO3	Analyze the energy transfer process in Turbomachines and governing equations of various forms.
			CO4	Design various Turbomachines for power plant and aircraft applications
16	22ME52G2	GAS TURBINE ENGINEERING	CO1	Apply the concepts of air standard cycle to analyze the performance of ideal and actual gas turbine cycles
			CO2	Apply gas turbine theory to jet propulsion and understand fabrication techniques of components.
			CO3	Analyse the Performance of compressors and combustion chambers
			CO4	Analyze the Performance of gas turbine and cogeneration systems.
17	22ME52G3	TURBO COMPRESSORS	CO1	Apply the concepts of thermodynamics to analyze compression and expansion processes
			CO2	Analyze the performance of compressors and centrifugal blowers
			CO3	Analyze the performance of turbines
			CO4	Analyze the Performance of compressors, centrifugal blowers and fans.
18	22ME52H1	ENERGY CONSERVATION, MANAGEMENT AND AUDIT	CO1	Analyze the present energy scenario and understand the need of energy conservation
			CO2	Apply various instruments in energy audit
			CO3	ply various measures of energy conservation and financial implications for various thermal utilities.
			CO4	audit the power plants, the various measures for energy conservation and financial implications for various thermal utilities.
			CO1	Understand concept of various forms of Non-renewable and renewable energy

  
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19	22ME52H2	RENEWABLE ENERGY TECHNOLOGY	CO2	line division aspects and utilization of renewable energy sources for both• domestics and industrial applications
			CO3	Study the environmental and cost economics of using renewable energy sources compared to fossil fuels
			CO4	Understand the commercial energy and renewable energy sources. Know the working principle of various energy systems
20	22ME52H3	SOLAR ENERGY AND WIND ENERGY	CO1	pose to Solar energy and its applications, wind energy and its applications, alternate energy sources
			CO2	Demonstrate the importance of renewable energy source and various applications of solar and wind systems
			CO3	Preliminary analysis related to wind energy systems and design of solar PV and solar thermal systems
			CO4	Identify the power electronic converters for solar PV and wind energy systems

  
 Professor I/C Academics

  
 HOD-ME

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