Sri Vasavi Engineering College (Autonomous)

(Sponsored by Sri Vasavi Educational Society)

(Approved by AICTE, New Delhi & Permanently affiliated to JNTUK, Kakinada)

(Accredited by NBA & NAAC with 'A' Grade, Recognized by UGC Under Section 2(f) & 12(B))

Pedatadepalli, Tadepalligudem, W.G.Dt, A.P-534101

DEPARTMENT OF MECHANICAL ENGINEERING

Course Outcomes (V21 Regulation)

M.Tech. I Semester

Name of the Course: Advanced Fluid Mechanics

Course Code: V21TET01

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Apply equations of motion for fluid flow and in viscid flow problems	K3
CO2	Analyze fluid flow using Navier stokes equation	K4
CO3	Explain Boundary layer concepts to flow over flat plate	K2
CO4	Analyze turbulent layer equations and internal flow	K4
CO5	Illustrate Compressible flow	K3

Name of the Course: Computational Fluid Dynamics

Course Code: V21TET02

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain various finite element formulations/methods	K2
CO2	Apply Hyperbolic equations for non linear problems	K3
CO3	Differentiate formulations of Compressible and incompressible flows	K4
CO4	Differentiate various formulations for 2D & 3D problems	K4
CO5	Illustrate various formulations for steady state and transient problems	K3

Name of the Course: Advanced I.C Engine Electric and Hybrid Vehicles (Program Elective – I)

Course Code: V21TEE01

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain static and dynamic effects of gas exchange process	K2
CO2	Illustrate motion of charge inside the cylinder	K3
CO3	Differentiate between the phenomena of combustion in IC engines	K4
CO4	Explain Electric vehicles and types of Batteries	K2
CO5	Analyze Hybrid and Fuel Cell Vehicles	K3

Name of the Course: Gas Dynamics (Program Elective – I)

Course Code: V21TEE02

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain equations governing compressible flows	K2
CO2	Explain one dimensional compressible flow concepts	K2
CO3	Explain Two dimensional compressible flow concepts	K2
CO4	Illustrate equations governing quasi one dimensional flows	K3
CO5	Illustrate Unsteady wave motions	K3

Name of the Course: Cryogenic Engineering (Program Elective – I)

Course Code: V21TEE03

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain Vapour compression Refrigeration System and its components	K2
CO2	Illustrate Multiple stage Refrigeration system	K3
CO3	Explain concepts of Cryogenics	K2
CO4	Illustrate the applications of Cryogenics	K3
CO5	Explain insulation to low temperatures	K2

Name of the Course: Advanced Thermodynamics (Program Elective – I)

Course Code: V21TEE04

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain availability and irreversibility	K2
CO2	Explain relations of thermodynamic properties	K2
CO3	Differentiate between properties of mixtures of gases and liquids	K4
CO4	Illustrate equilibrium of vapour and liquid mixtures	K3
CO5	Explain combustion phenomena and reactions involved in combustion	K2

Name of the Course: Gas Turbines (Program Elective – II)

Course Code: V21TEE05

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain turbo machines and cycles used in gas turbines	K2
CO2	Apply the concepts of rotating machines and centrifugal compressors	K3
CO3	Analyze Axial flow compressors and design concepts	K4
CO4	Illustrate Gas turbine combustion systems	K3
CO5	Illustrate Axial and Radial flow turbines	K3

Name of the Course: Alternative Fuel Technologies (Program Elective – II)

Course Code: V21TEE06

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain alternative fuels	K2
CO2	Explain production methods of alternative fuels	K2
CO3	Illustrate performance characteristics of liquid alternative fuels	K3
CO4	Illustrate performance characteristics of gaseous alternative fuels	K3
CO5	Analyze performance characteristics of alternative fuels and methods to improve efficiency	K4

Name of the Course: Energy Conservation and Management (Program Elective – II)

Course Code: V21TEE07

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain the importance of energy conservation and management	K2
CO2	Explain various methods of energy conservation	K2
CO3	Illustrate various methods of energy management	K3
CO4	Illustrate Economic analysis	K3
CO5	Explain standards and laws of energy conservation and management	K2

Name of the Course: Theory and Technology of Fuel Cells (Program Elective – II)

Course Code: V21TEE08

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain concepts of Fuel cells	K2
CO2	Explain various models of Fuels cells	K2
CO3	Illustrate Low and High temperature fuel cells	K3
CO4	Determine the production of fuels and design of various fuel cells	K4
CO5	Explain the components of fuel cell system	K2

Name of the Course: Computational Fluid Dynamics Lab – I

Course Code: V21TEL01

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Analyze flow through pipes, Heat exchanger	K4
CO2	Analyze performance characteristics of combustion and air cooler	K4
CO3	Analyze thermal stresses, temperature gradient & Radiation heat transfer in cylinders	K4
CO4	Determination of Insulated Wall Temperature, thermal loading of support structure	K4
CO5	Illustrate Solid Liquid Phase Change	K3

Name of the Course: Thermal Engineering Lab – I

Course Code: V21TEL02

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Determination of fuel properties	K4
CO2	Investigate the exhaust emissions of IC Engines	K4
CO3	Test the Performance of compressors & IC Engines	K4

M.Tech. II Semester

Name of the Course: Advanced Heat and Mass Transfer

Course Code: V21TET03

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain Equations governing heat conduction heat transfer	K2
CO2	Illustrate finite difference methods for heat conduction and convection problems	K3
CO3	Analyze heat and mass transfer in internal and external flows	K4
CO4	Explain concepts related to free convection, boiling & condensation and Heat exchangers	K2
CO5	Explain concepts of Radiation heat transfer and mass transfer.	K2

Name of the Course: Thermal Measurements and Process Controls

Course Code: V21TET04

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain elements of measuring instruments	K2
CO2	Explain flow measuring devices	K2
CO3	Explain temperature measurement methods	K2
CO4	Illustrate various indicating, recording and data acquisition systems	K3
CO5	Analyze various process control systems	K4

Name of the Course: Equipment Design for Thermal Systems (Program Elective – III)

Course Code: V21TEE09

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain various Heat Exchangers and methods of designing them	K2
CO2	Illustrate design of double pipe heat exchanger	K3
CO3	Demonstrate condensation of vapours	K3
CO4	Explain concepts of vaporizers, evaporators and reboilers	K3
CO5	Outline concepts of designing of direct contact heat exchangers	K4

Name of the Course: Solar Energy Technologies (Program Elective – III)

Course Code: V21TEE10

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain various elements of solar energy systems	K2
CO2	Illustrate the design of solar water heating system	K3
CO3	Illustrate solar energy storage systems	K3
CO4	Explain performance characteristics and energy conversion systems	K2
CO5	Explain economics of solar energy systems	K2

Name of the Course: Advanced Power Plant Engineering (Program Elective – III)

Course Code: V21TEE11

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain various components of Steam power plant	K2
CO2	Explain various components of Gas turbine & Hydro power plant	K2
CO3	Explain Nuclear power station and types of reactors	K2
CO4	Illustrate operation of combined power plants	K3
CO5	Outline economics and environmental considerations of power plants	K4

Name of the Course: Combustion, Emissions and Environment (Program Elective – III)

Course Code: V21TEE12

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain principles of combustion	K2
CO2	Illustrate the combustion phenomena	K3
CO3	Differentiate the laminar and turbulent flame propagation	K4
CO4	Illustrate the measurement and control of pollution	K3
CO5	Explain environmental considerations of pollution	K2

Name of the Course: Jet Propulsion and Rocket Engineering (Program Elective – III)

Course Code: V21TEE13

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain Turbo Jet propulsion systems	K2
CO2	Outline the principles and characteristic parameters of jet propulsion and rockets	K4
CO3	Illustrate chemical formulations of combustion products	K2
CO4	Differentiate solid and liquid propellant rocket systems	K4
CO5	Explain Ramjet propellant rocket system	K2

Name of the Course: Automotive Engineering (Program Elective – IV)

Course Code: V21TEE14

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain classification of automobiles	K2
CO2	Illustrate Fuel, ignition and electrical systems of automobile	K3
CO3	Illustrate Cooling and lubrication systems of automobile	K3
CO4	Illustrate Steering system of automobile	K3
CO5	Explain automation in automobiles	K2

Name of the Course: Modelling of IC Engines (Program Elective – IV)

Course Code: V21TEE15

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain fundamentals of IC Engine modeling	K2
CO2	Analyze thermodynamic combustion models of IC Engines	K4
CO3	Illustrate spray behavior of fuels	K3
CO4	Illustrate modeling of charging system	K3
CO5	Explain mathematical models of SI Engines	K2

Name of the Course: Renewable Energy Technologies (Program Elective – IV)

Course Code: V21TEE16

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain solar energy and its applications	K2
CO2	Explain Geothermal energy and techniques of harnessing it	K2
CO3	Illustrate energy conversion systems and application of hydrogen as fuel	K3
CO4	Illustrate Bio energy systems	K3
CO5	Illustrate Wind and Tidal energy systems	K3

Name of the Course: Computational Fluid Dynamics Lab – II

Course Code: V21TEL03

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Analyze the 3D laminar flow through pipe, internal & external flow and rectangular duct.	K4
CO2	Determine the variation of various parameters of rotor & rotary compressor and various losses in pipe flow due to variation of cross section	K4
CO3	Analyze Steady and transient state analysis of solids	K4
CO4	Analyze structural analysis of rectangular plate with hole and orifice in cylinder	K4
CO5	Analyze structural analysis of pressure and velocity in convergent divergent nozzle	K4

Name of the Course: Thermal Engineering Lab – II

Course Code: V21TEL04

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Determination of Heat transfer coefficient in convective heat transfer	K4
CO2	Examine the emissivity of test plate	K4
CO3	Test the performance of heat exchanger, Solar flat plate collector and water cooler	K4

M.Tech. III Semester

Name of the Course: Optimization Techniques & Applications (Program Elective – V)

Course Code: V21TEE17

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain various single variable optimization techniques	K2
CO2	Illustrate various multi variable optimization techniques	K3
CO3	Explain various linear programming methods	K2
CO4	Explain various non traditional optimization algorithms	K2
CO5	Analyze various applications of optimization techniques to thermal systems	K4

Name of the Course: Design and Analysis of Experiments (Program Elective – V)

Course Code: V21TEE18

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain various strategy of experimentation	K2
CO2	Illustrate various factorial design	K3
CO3	Illustrate various two level factorial design	K3
CO4	Analyze various regression models	K4
CO5	Illustrate the Response surface methods	K3

Name of the Course: Convective Heat Transfer (Program Elective – V)

Course Code: V21TEE19

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain free, forced convection and equations governing the phenomena	K2
CO2	Illustrate convection heat transfer in laminar, turbulent flows both internal & external	K3
CO3	Illustrate equations of natural convection laminar flow heat transfer	K3
CO4	Analyze equations of combined convection heat transfer in laminar and turbulent flows	K4
CO5	Explain convection heat transfer in porous media	K3

Name of the Course: Extraction of Energy from Waste (Program Elective – V)

Course Code: V21TEE20

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain energy from waste, types of waste and energy conversion devices.	K2
CO2	Explain the methods of yield of biomass	K2
CO3	Illustrate various gasifiers of biomass	K3
CO4	Illustration various combustors of biomass	K3
CO5	Explain concepts of biogas technology	K2

Name of the Course: Advanced Finite Elements Methods (Program Elective – V)

Course Code: V21TEE21

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain various approaches to finite element formulations	K2
CO2	Illustrate the displacement, stresses of ID elements used in Finite element analysis	K3
CO3	Differentiate various 2D elements used in Finite element analysis	K4
CO4	Illustrate the iso parametric formulation and convergence criteria	K3
CO5	Analyze the various elements in structural analysis	K4

HoD - ME
Head of the Department
Mechanical Engineering
Sri Vasavi Engineering College
TADEPALLIGUDEM-534 101