

Government College of Engineering, Salem - 11
Department of Mechanical Engineering
M.E. - Thermal Engineering
COs - POs and PSO Mapping
Course Articulation Matrix – 18 Regulation

Semester - I															
18THC11 - Thermodynamics And Combustion															
		Program Outcomes												Program Specific Outcomes	
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	To impart the fundamental concepts about availability	2	1	-	1	-	1	1	-	-	-	2	3	2	1
2	To impart knowledge on real gas behaviour and different thermodynamic relationship.	1	3	2	2	2	2	-	-	-	-	2	2	2	2
3	To study the combustion principles and statistical interpretation of thermodynamic laws.	2	2	2	2	1	1	1	-	-	-	2	3	1	1
Average		1.7	2	1.3	1.7	1	1.3	0.7	-	-	-	2	2.7	1.7	1.3

Semester - I															
18THC12 - Advanced Fluid Dynamics															
		Program Outcomes											Program Specific Outcomes		
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	To understand the fundamental equation for fluid flow.	2	2	2	2	2	1	1	1	-	-	1	2	3	-
2	To impart knowledge to find solution for Navier stokes equation	3	1	1	-	1	1	-	-	-	-	1	2	3	-
3	To understand the concept of boundary layer and find solution for boundary layer equation.	3	2	2	2	2	1	1	-	-	-	1	2	2	1
Average		2.7	1.7	1.7	1.3	1.7	1	0.7	0.3	-	-	1	2	2.7	0.3

Semester - I															
18THC13 - Thermal Laboratory- I															
		Program Outcomes												Program Specific Outcomes	
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Understand the concepts of thermal conductivity.	1	-	1	3	3	2	1	-	2	-	2	2	2	3
2	Understand the concepts of forced and natural convection.	2	-	1	3	2	2	-	-	2	-	2	2	3	3
3	Understand the working principle and performance of IC Engine.	1	2	2	2	2	1	-	-	1	1	2	2	1	2
Average		1.3	0.7	1.3	2.7	2.3	1.7	0.3	-	1.7	0.3	2	2	2	2.7

Semester - I															
18THC14 - Simulation Laboratory															
Course Outcomes		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	To develop modelling and analysis skills on steady state heat conduction, convection and radiation problems	-	2	2	2	2	1	1	-	-	-	2	2	3	1
2	To develop modelling and analysis skills on unsteady state heat conduction, convection and radiation problems	2	2	3	2	2	1	2	1	-	-	2	3	3	1
3	To develop modelling and analysis on phase change processes heat transfer.	2	2	2	3	2	2	1	1	-	-	2	1	2	2
Average		1.3	2	2.3	2.3	2	1.3	1.3	0.7	-	-	2	2	2.7	1.3

Semester - I															
18MLC01 - Research Methodology And IPR															
		Program Outcomes												Program Specific Outcomes	
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	To develop the skills required for defining research problems.	2	3	2	2	2	1	1	-	-	-	2	1	3	-
2	To develop skills required for effective literature studies.	2	3	3	2	2	1	1	1	-	-	2	1	3	-
3	To develop technical thesis writing skills.	-	-	-	-	-	2	1	-	3	3	2	1	3	1
4	To impart knowledge about IPR.	1	-	-	-	2	2	2	-	2	-	2	2	2	3
Average		1.3	1.5	1.3	1	1.5	1.5	1.3	0.3	1.3	0.8	2	1.3	2.8	1

Semester - II															
18THC21 - Advanced Heat Transfer															
Course Outcomes		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	To study Heisler and Grober charts and to discuss about transient heat conduction	2	2	2	2	2	1	2	-	-	-	1	2	2	2
2	To compare and optimization of longitudinal fin of rectangular, triangular, and parabolic profiles	3	3	2	2	2	1	1	-	-	-	1	2	3	1
3	To understand boundary layers and to formulate pool and flow boiling correlations	2	3	2	2	2	1	-	-	-	-	1	3	1	1
4	To discuss thermal radiation, view factor, gas radiation, radiation effect on temperature measurement.	2	3	3	3	2	2	1	-	-	-	1	2	2	1
5	analyze thermal and gas radiation in heat transfer equipment.	-	3	3	3	2	2	1	-	-	2	1	2	2	-
Average		1.8	2.8	2.4	2.4	2	1.4	1	-	-	0.4	1	2.2	2	1

Semester - II															
18THC22 - Instrumentation For Thermal Systems															
Course Outcomes		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Select the suitable measurement technique	2	1	2	2	3	1	1	-	-	-	2	1	2	1
2	Choose the suitable instruments for measurement	2	1	2	2	3	1	1	-	-	-	2	1	2	1
3	Apply the correct advanced techniques in measurement	2	1	3	2	3	1	1	-	-	-	2	2	2	1
4	Use the data acquisition system in the real time measurements	1	2	2	3	2	1	1	-	-	-	2	2	2	1
Average		1.8	1.3	2.3	2.3	2.8	1	1	-	-	-	2	1.5	2	1

Semester - II															
18THC23 - Thermal Laboratory - II															
		Program Outcomes												Program Specific Outcomes	
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	To analyze the performance of several types of heat exchangers.	2	1	1	3	3	1	1	-	-	-	2	2	3	2
2	To analyze the performance of refrigeration system.	3	3	2	1	1	1	-	-	-	-	2	2	3	1
3	To analyze the performance of air conditioning systems.	2	2	1	2	2	1	-	-	-	-	2	2	3	1
Average		2.3	2	1.3	2	2	1	0.3	-	-	-	2	2	3	1.3

Semester - II															
18THC24 - Modelling Laboratory															
		Program Outcomes												Program Specific Outcomes	
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	To impart the fundamental knowledge on using MATLAB.	1	3	2	3	2	1	1	-	-	-	2	2	3	-
2	To impart knowledge on how MATLAB tool is used by solving various heat transfer problems.	3	3	2	2	2	1	1	-	-	-	2	3	2	-
Average		2	3	2	2.5	2	1	1	-	-	-	2	2.5	2.5	-

Semester - III															
18THC25 - Mini Project															
		Program Outcomes												Program Specific Outcomes	
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Get an opportunity to work in actual industrial environment if they opt for internship.	-	1	2	3	-	1	3	-	1	1	-	-	-	1
2	Solve live problem using software or analytical or computational tools.	-	2	3	3	-	2	3	-	2	1	-	2	3	-
3	Write technical reports.	-	2	3	3	-	2	3	-	2	2	-	2	-	-
4	Develop skills to present and defend their work in front of technically qualified audience	-	2	3	3	-	2	3	-	3	2	-	-	-	-
Average		-	1.8	2.8	3	-	1.8	3	-	2	1.5	-	1	0.8	0.3

Semester - III															
18THC31 - Dissertation Phase – I															
Course Outcomes		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Practice self-learning on various topics.	1	3	3	1	1	1	1	1	2	1	1	-	1	1
2	Learn to write technical reports.	2	-	1	2	-	1	-	1	2	1	-	1	2	-
3	Develop oral and written communication skills to present and defend their audience work in front of technically qualified.	-	-	-	-	-	2	-	1	-	1	-	-	2	-
4	Conduct tests on existing setups/equipment and draw logical conclusions from the results after analysing them.	-	-	-	-	-	2	2	-	1	-	1	-	-	1
5	Work in a research environment or in an industrial environment.	1	1	1	-	3	-	1	1	-	-	-	-	-	1
Average		0.8	0.8	1	0.6	0.8	1.2	0.8	0.8	1	0.6	0.4	0.2	1	0.6

Semester - IV															
18THC41 - Dissertation Phase – II															
Course Outcomes		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Use different experimental techniques	1	3	3	1	1	1	1	1	2	1	1	-	-	-
2	Design and develop an experimental set up/ equipment/test rig.	-	1	1	-	-	-	3	1		1	-	-	-	1
3	Conduct tests on existing set ups/equipment and draw logical conclusions from the results after analyzing them.	2	-	1	2	-	1	-	1	2	1	1	-	-	1
4	Work in a research environment or in an industrial environment	-	-	-	-	-	2	-	1	-	1	-	-	-	1
5	Conversant with technical report writing.	-	-	-	-	-	2	2	-	1	-	1	-	-	1
6	Present and convince their topic of study to the engineering community.	1	1	1	-	-	1	3	1	1	-	1	-	-	2
Average		0.7	0.8	1	0.5	0.2	1.2	1.5	0.8	1.2	0.7	0.7	-	-	1

Elective - 1															
18CDE11 - Advanced Mathematical Methods in Engineering															
Course Outcomes		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Obtain the numerical solution of linear and non-linear equations and fitting curves by method of least squares.	3	2	1	1	2	1	1	-	-	-	1	1	2	-
2	Obtain the solution of wave equation using of Eigen function	3	2	1	1	2	1	-	-	-	-	1	1	1	1
3	Obtain the solutions of diffusion and wave equation involved in engineering problems using Laplace and Fourier transform techniques.	2	3	2	2	2	1	1	-	-	-	1	1	2	-
4	Gain the knowledge on statistical sampling and its applications, analysis of variance as one and two Way classification.	2	3	2	1	2	-	-	-	-	-	1	1	1	-
Average		2.5	2.5	1.5	1.3	2	0.8	0.5	-	-	-	1	1	1.5	0.3

Elective - 1															
18THE11 - Nuclear Engineering															
		Program Outcomes												Program Specific Outcomes	
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Understand the nuclear reactions and breeding.	2	1	1	2	2	1	1	-	-	-	1	2	-	1
2	Explain the diffusion and reactor kinetics.	3	1	1	1	1	1	1	-	-	-	1	2	1	-
3	Understand heat removal from reactor core, reactor safety and radiation protection.	3	2	1	1	1	1	1	-	-	-	2	2	2	-
Average		2.7	1.3	1	1.3	1.3	1	1	-	-	-	1.3	2	1	0.3

Elective - 1															
18THE12 - Energy Conservation and Management															
Course Outcomes		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Describe the present energy scenario of India and standards and EC act.	1	2	1	1	2	1	2	-	2	3	1	1	3	3
2	Analyze and optimize the energy requirement and identify the suitable instrument for energy audit.	2	3	2	1	2	1	-	-	-	-	1	2	3	-
3	Analyze the cost vs. energy and identify suitable technique for cost analysis.	2	3	2	2	2	1	1	-	-	-	1	1	3	2
4	Examine the performance analysis of thermal equipment.	2	3	2	1	2	-	-	-	-	-	1	2	3	-
Average		1.8	2.8	1.8	1.3	2	0.8	0.8	-	0.5	0.8	1	1.5	3	1.3

Elective - 1															
18THE13 - Alternative Fuels for I.C. Engines															
		Program Outcomes												Program Specific Outcomes	
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Describe various alternative fuels for IC engine.	2	2	1	2	2	1	-	-	-	-	1	2	1	-
2	Examine the characteristics of various liquid and gases fuels suitable for SI and CI engine.	2	2	1	2	2	1	-	-	-	-	1	2	2	-
3	Understand the concept of electric, hybrid and fuel cell vehicles.	2	2	1	1	2	1	-	-	-	-	1	2	1	-
Average		2	2	1	1.7	2	1	-	-	-	-	1	2	1.3	-

Elective - 1															
18THE14 - Electronic Engine Management Systems															
		Program Outcomes												Program Specific Outcomes	
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Understand the different electronic components available in the present days engine management system.	2	1	1	1	2	2	3	-	-	-	1	1	2	1
2	Understand the role of electronic components in SI and CI Engine management system.	2	1	1	2	2	2	2	-	-	-	1	2	2	1
3	Understand the role of electronic components in vehicle management system.	2	1	1	2	2	1	2	-	-	-	1	2	1	1
Average		2	1	1	1.7	2	1.7	2.3	-	-	-	1	1.7	1.7	1

Elective - 1															
18THE15 - Analysis Of Heat Transfer															
Course Outcomes		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Calculate and evaluate the impacts of initial and boundary conditions on the solutions of a particular Heat transfer problem	2	3	2	2	3	1	-	-	-	-	1	2	1	-
2	Evaluate the relative contributions of different modes of heat transfer.	2	3	2	2	3	1	-	-	-	-	1	2	2	-
3	Apply the heat transfer principles to design and to evaluate performance of thermal systems	2	2	3	3	2	1	-	-	-	-	1	2	1	-
Average		2	2.7	2.3	2.3	2.7	1	-	-	-	-	1	2	1.3	-

Elective - 2

18THE21 - Air conditioning system design

		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Understand the construction and design features Air-conditioning system.	2	2	1	1	2	1	1	-	-	-	1	2	2	-
2	Describe various types' loads and design the air conditioning system for a specific application.	2	2	1	2	2	1	1	-	-	-	1	2	3	-
3	Understand the components involved in air distribution system and able to design seasonal energy efficient system	3	2	1	2	3	1	-	-	-	-	1	2	2	-
Average		2.3	2	1	1.7	2.3	1	0.7	-	-	-	1	2	2.3	-

Elective - 2**18THE22 - Advanced IC Engines**

		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Understand the combustion process, and the fuel injection techniques adopted in modern day IC engines	2	2	1	2	3	2	1	-	-	-	1	2	2	1
2	Adopt potential alternative fuel systems and exposed to recent developments in engine technology	2	2	3	3	2	-	-	-	-	-	1	2	2	2
Average		2	2	2	2.5	2.5	1	0.5	-	-	-	1	2	2	1.5

Elective - 2

18THE23 - Optimization Techniques in Engineering

		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Formulate the suitable optimization technique to the engineering applications	2	3	2	2	3	1	-	-	-	-	1	2	2	1
2	Find the suitable optimization method for a real life problems in engineering field	2	3	2	2	3	1	2	-	-	-	1	2	2	1
3	Apply the concept of nontraditional optimization	2	3	2	2	2	1	1	-	-	-	1	1	1	-
4	Choose a suitable method of linear programming for a particular application	2	3	3	2	2	1	-	-	-	-	1	2	1	-
Average		2	3	2.3	2	2.5	1	0.8	-	-	-	1	1.8	1.5	0.5

Elective - 2**18THE24 - Boundary Layer Theory and Turbulence**

		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Problems related to boundary layer theory and turbulence	2	2	1	2	3	2	1	-	-	-	1	2	1	-
2	Understand the statistical theory and kinematics of turbulence	2	2	3	3	2	-	-	-	-	-	1	2	2	-
3	Understand the turbulence models and turbulent flows	2	2	2	2	2	-	-	-	-	-	1	2	2	-
Average		2	2	2	2.3	2.3	0.7	0.3	-	-	-	1	2	1.7	-

Elective - 2															
18THE25 - Combustion In Ic Engines															
		Program Outcomes												Program Specific Outcomes	
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Understand the combustion processes and form combustion equation.	2	2	1	2	2	1	1	-	-	-	1	2	2	-
2	Understand the concepts of chemical kinetics and combustion in SI and CI engine.	2	2	2	2	3	1	-	-	-	-	1	3	1	-
3	Understand the concepts of combustion taking place in gas engine and analyse the factors affecting their performance.	2	3	3	2	2	-	-	-	-	-	1	2	1	1
Average		2	2.3	2	2	2.3	0.7	0.3	-	-	-	1	2.3	1.3	0.3

Elective - 2

18CDE26 - Nanomaterials Technology

		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Understand processing techniques for nanomaterials.	2	2	1	3	2	1	1	-	1	-	-	1	1	-
2	Knowledge about various properties of nano-materials and to optimize the methods for specific Material application	1	1	2	1	-	1	1	-	2	1	1	-	-	-
3	Use various nano-fluids in the fields of engineering.	2	2	1	2	2	1	1	-	2	1	1	1	-	-
4	Use of Nano particles for the health, ecological and environmental hazards	1	1	1	1	-	-	-	2	2	2	2	1	-	1
Average		1.5	1.5	1.3	1.8	1	0.8	0.8	0.5	1.8	1	1	0.8	0.3	0.3

Elective - 3

18THE31 - Refrigeration and Cryogenics

		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Analyse the various cycles of refrigeration	2	3	2	3	3	1	-	-	-	-	1	2	3	-
2	Design the refrigeration system components	2	3	3	2	3	1	-	-	-	-	1	2	3	1
3	Choose the suitable method of gas liquefaction	2	3	2	2	2	1	-	-	-	-	1	2	2	-
4	Select the required storage method for the cryogenics liquids	2	2	1	2	2	1	-	-	-	-	1	2	2	-
Average		2	2.8	2	2.3	2.5	1	-	-	-	-	1	2	2.5	0.3

Elective - 3

18THE32 - Design of Heat Exchangers

		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Apply the knowledge of the in designing the heat exchangers	2	2	3	2	1	1	-	-	-	-	1	2	2	-
2	Choose the method of analysing the heat exchangers	2	3	2	3	2	1	1	-	-	-	1	2	2	-
3	Design the double pipe & other heat exchangers for a particular application	2	2	2	3	2	1	1	-	-	-	1	2	3	-
4	Apply the concepts of simulation & optimization of the designing	2	2	2	2	3	-	2	-	-	-	1	2	3	1
Average		2	2.3	2.3	2.5	2	0.8	1	-	-	-	1	2	2.5	0.3

Elective - 3

18THE33 - Cogeneration and Waste Heat Recovery Systems

		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Apply a suitable technology for waste heat management	1	-	2	-	2	2	1	-	2	-	1	2	1	1
2	Find a suitable heat recovery technology for a particular field	2	2	2	2	2	2	2	-	-	-	1	2	-	2
3	Select a proper heat recovery system to enhance the performance	2	3	2	2	2	1	-	-	-	-	1	2	-	2
4	Do the economic analysis of cogeneration and heat recovery	1	1	2	2	1	2	3	-	2	2	1	1	1	-
Average		1.5	1.5	2	1.5	1.8	1.8	1.5	-	1	0.5	1	1.8	0.5	1.3

Elective - 3

18THE34 - Design Of Condensers Evaporators and Cooling Towers

		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Design a suitable type of condensers for a particular application	2	1	2	3	2	1	1	-	-	-	1	1	2	1
2	Design the particular type of cooling tower for improving the plant performance	2	1	2	3	2	1	1	-	-	-	1	1	2	1
3	Select the suitable type of heat exchanger in the plants	2	1	2	2	2	1	-	-	-	-	1	2	1	-
4	Choose the required type of evaporator for any application	3	2	2	2	3	1	-	-	-	-	1	2	1	1
Average		2.3	1.3	2	2.5	2.3	1	0.5	-	-	-	1	1.5	1.5	0.8

Elective - 3**18THE35 - Steam Engineering**

		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Explain the steam generation, combustion, and the boiler standards	3	2	1	3	2	1	2	-	-	-	1	2	-	-
2	Use techniques, skills, and modern engineering tools necessary for boiler performance assessment	3	2	1	2	3	1	2	-	-	-	1	2	2	1
3	Design a steam piping system, its components for a process and also design economical and effective insulation	2	1	2	2	2	-	1	-	1	2	1	2	1	1
4	Design and develop controls and instrumentation for effective monitoring of the process.	-	1	2	3	2	-	1	-	1	2	1	1	2	-
Average		2	1.5	1.5	2.5	2.3	0.5	1.5	-	0.5	1	1	1.8	1.3	0.5

Elective - 4

18THE41 - Computational Fluid Dynamics

		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Solve the problems in conduction and convection heat transfer	2	3	2	2	2	1	-	-	-	-	1	2	1	-
2	Model and grids generation for heat transfer	2	2	2	2	3	1	-	-	-	-	1	1	2	2
3	Apply the suitable CFD technique to the real life problems	2	3	3	2	2	-	-	-	-	-	1	1	3	-
4	Solve the problems in incompressible fluid flow field	3	3	2	1	2	1	-	-	-	-	1	2	2	1
Average		2.3	2.8	2.3	1.8	2.3	0.8	-	-	-	-	1	1.5	2	0.8

Elective - IV**18THE42 - Simulation of IC Engines Processes**

		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Apply the knowledge to model an IC engine	2	2	3	2	2	2	-	-	-	-	1	2	2	-
2	Analyse the components of IC engine	2	3	3	2	3	2	-	-	-	-	1	1	2	-
3	Frame the suitable mathematical models for an SI & CI engines	3	3	2	1	2	-	-	-	-	-	1	2	2	-
4	Apply the concepts of simulation to the IC engine components	2	3	3	2	3	2	-	-	-	-	1	1	2	-
Average		2.3	2.8	2.8	1.8	2.5	1.5	-	-	-	-	1	1.5	2	-

Elective - IV**18THE43 - Fuels and Combustion**

		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Apply the knowledge of combustion kinetics for characteristics of fuel.	2	2	1	2	2	1	-	-	-	-	1	3	1	1
2	Calculate the correct air fuel ratio for complete combustion	2	3	1	3	3	-	-	-	-	-	1	2	2	-
3	Select the suitable combustion equipment for particular fuel burning	2	1	1	3	2	1	-	-	-	-	1	2	2	-
4	Design a suitable combustion equipment for burning combination of fuels	2	2	2	3	2	1	1	-	-	-	1	1	3	-
Average		2	2	1.3	2.8	2.3	0.8	0.3	-	-	-	1	2	2	0.3

Elective - IV

18THE44 - Environment and Pollution Control

		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Identify the air pollutant control devices	2	2	1	2	3	-	-	-	-	-	1	1	1	2
2	Differentiate the treatment techniques used for sewage and industrial wastewater Treatment methods.	2	2	1	1	2	2	3	-	2	1	1	1	1	2
3	Understand the fundamentals of solid waste management, practices adopted in his town/village and its importance in keeping the health of the city.	2	2	3	1	2	2	3	-	2	1	1	2	3	-
Average		2	2	1.7	1.3	2.3	1.3	2	-	1.3	0.7	1	1.3	1.7	1.3

Elective - IV

18THE45 - Modern Power Plant Engineering

		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Identify the possible mitigation of anthropogenic emissions by optimizing the power plant cycles or Utilities	2	2	3	-	1	2	2	-	-	-	1	1	1	1
2	Understand the operation of various power plants in India	2	2	1	1	2	2	1	-	2	1	1	1	1	-
3	Choose a suitable combined cycle power plant for better performance	2	3	1	2	2	1	-	-	-	-	1	2	1	-
4	Apply and follow the government and legislation policies imposed on pollution control	2	1	3	1	2	2	2	-	2	3	1	-	-	2
Average		2	2	2	1	1.8	1.8	1.3	-	1	1	1	1	0.8	0.8

Elective - V															
18THE51 - Design of Solar and Wind System															
Course Outcomes		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Suggest and design solar thermal based applications	2	2	2	3	2	1	1	-	-	-	1	2	3	-
2	Designing of solar photovoltaic based power systems for both domestic and industrial applications	2	3	2	2	2	1	2	-	-	-	1	2	3	1
3	Know the energy conversion techniques in wind energy	3	1	2	3	2	-	-	-	-	-	1	2	2	-
4	Learn about wind turbine components and their constructions	2	2	3	3	2	1	1	-	-	-	1	2	2	-
Average		2.3	2	2.3	2.8	2	0.8	1	-	-	-	1	2	2.5	0.3

Elective - V**18THE52 - Design and Analysis of Turbomachines**

		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Understand the design principles of the Turbomachines	2	2	3	2	2	1	-	-	-	-	1	2	3	-
2	Analyze the Turbomachines to improve and optimize its performance	2	3	1	2	3	1	1	-	-	-	1	2	3	-
3	Able to study and analysis the various engine cycles	3	2	2	2	2	-	1	-	-	-	1	2	2	-
Average		2.3	2.3	2	2	2.3	0.7	0.7	-	-	-	1	2	2.7	-

Elective - V															
18THE53 - Energy Systems Modelling and Analysis															
		Program Outcomes												Program Specific Outcomes	
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Simulate and model of typical energy system	2	3	2	3	2	1	1	-	-	-	2	1	2	-
2	Analysis the effects of constraints on the performance of energy systems	2	2	2	2	2	-	1	-	-	-	1	1	3	-
3	Have a potential to do design HEN net work and perform energy-economic analysis for a typical applications	2	1	1	2	2	1	2	-	2	2	1	1	3	1
Average		2	2	1.7	2.3	2	0.7	1.3	-	0.7	0.7	1.3	1	2.7	0.3

Elective - V															
18THE54 - Internal Combustion Engine Design															
		Program Outcomes												Program Specific Outcomes	
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Demonstrate the basics of engine design	2	2	2	2	3	1	1	2	-	-	1	2	1	-
2	Design major engine components	2	2	1	1	2	1	1	-	1	2	-	2	1	-
3	Design two stroke engines and study the applications of computers in engine design	3	2	2	3	3	1	-	-	-	-	1	2	2	-
Average		2.3	2	1.7	2	2.7	1	0.7	0.7	0.3	0.7	0.7	2	1.3	-

Elective - V															
18THE55 - Advanced Finite Element Analysis															
Course Outcomes		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Understand of FE formulation for linear problems in solid mechanics	2	2	2	2	3	1	1	-	-	-	1	1	2	1
2	Understand behaviour of elastic-plastic materials and viscoplasticity, Use of Newton-raphson method for solving nonlinear equations of equilibrium	3	3	2	2	2	-	-	-	-	-	1	1	2	-
3	Understand flow rules and strain hardening, loading and unloading conditions, Drucker's stability postulates, J2 flow of theory of plasticity	3	2	2	3	2	1	2	-	-	-	1	1	2	1
Average		2.7	2.3	2	2.3	2.3	0.7	1	-	-	-	1	1	2	0.7

Elective - VI															
18THE61 - Business Analytics															
Course Outcomes		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Demonstrate knowledge of data analytics.	2	3	-	1	1	1	2	-	-	-	1	1	3	-
2	Demonstrate how to think critically in making decisions based on data and deep analytics.	1	3	1	1	1	1	-	-	-	-	1	1	2	-
3	Demonstrate to use technical skills in predictive and prescriptive modeling to support business Decision-making.	1	1	1	2	3	-	1	-	-	-	1	2	2	1
4	Translate data into clear, actionable insights.	1	1	1	-	1	1	-	3	-	2	1	1	2	1
Average		1.3	2	0.8	1	1.5	0.8	0.8	0.8	-	0.5	1	1.3	2.3	0.5

Elective - VI**18THE62 - Industrial Safety**

		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Convey knowledge on safe work practices in offices, industry and construction.	3	2	1	1	1	1	2	1	-	-	1	2	-	2
2	To understand the maintenance concept.	1	1	1	1	1	1	-	-	-	-	1	-	-	1
3	Select suitable techniques to trace faults in industry.	1	1	1	1	3	-	1	-	-	-	1	-	-	2
4	Select and apply the proper maintenance techniques to industrial equipment.	1	1	1	-	3	1	-	2	-	2	1	-	-	2
Average		1.5	1.3	1	0.8	2	0.8	0.8	0.8	-	0.5	1	0.5	-	1.8

Elective - VI**18THE63 - Operations Research**

		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Apply the dynamic programming to solve problems of discrete and continuous variables	3	1	1	-	-	1	2	-	2	-	1	2	2	-
2	Apply the concept of non-linear programming	1	1	1	1	1	-	-	-	2	1	1	2	2	-
3	Carry out sensitivity analysis	2	3	1	1	1	1	-	-	-	-	1	1	3	-
4	Model the real world problem	1	2	1	1	1	-	1	-	-	1	1	-	-	2
Average		1.8	1.8	1	0.8	0.8	0.5	0.8	-	1	0.5	1	1.3	1.8	0.5

Elective - VI															
18THE64 - Cost Management of Engineering Projects															
Course Outcomes		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Explain the concepts of cost management and decision making	2	2	1	1	-	-	-	1	1	1	1	-	-	1
2	Explain the concept of projects, its process, objectives and functions of project management	1	1	1	1	-	-	-	1	1	-	1	-	-	1
3	Analyze costing techniques and cost-volume-profit relationships	1	3	2	1	1	-	-	1	1	1	1	-	-	2
4	Apply the pricing strategies and budgetary controls	1	1	1	2	1	1	1	-	-	1	1	-	-	1
5	Select the appropriate quantitative techniques for cost management	1	1	1	1	3	-	-	1	1	-	1	-	-	1
Average		1.2	1.6	1.2	1.2	1	0.2	0.2	0.8	0.8	0.6	1	-	-	1.2

Elective - VI**18THE65 - Waste to Energy**

		Program Outcomes												Program Specific Outcomes	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Understand the concepts of energy conversion technique from waste.	1	1	1	1	-	-	1	-	-	2	1	-	-	1
2	Understand biogas generation techniques such as pyrolysis, gasification and combustion.	1	1	1	-	-	-	2	1	-	3	1	-	-	1
3	Identify the suitable method for available waste.	1	1	1	-	-	-	1	-	-	3	1	-	-	1
Average		1	1	1	0.3	-	-	1.3	0.3	-	2.7	1	-	-	1

Audit Courses															
18AC-1 - English for Research Paper Writing															
		Program Outcomes												Program Specific Outcomes	
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Practice the unique qualities of a professional writing style	1	1	1	1	-	-	1	-	-	2	1	1	2	-
2	Recognize, explain, and use the verbal strategies and the formal elements	1	1	1	-	-	-	2	1	-	3	1	-	-	-
3	Collect, analyze, document, and report research clearly, concisely, logically, and ethically	1	1	1	-	-	-	1	-	-	3	1	-	-	1
4	Participate actively in writing activities that model effective scientific and technical papers.	1	2	1	1	1	-	1	-	-	1	1	-	-	1
Average		1	1.3	1	0.5	0.3	-	1.3	0.3	-	2.3	1	0.3	0.5	0.5

Audit Courses															
18AC-2 - Disaster Management															
		Program Outcomes												Program Specific Outcomes	
Course Outcomes		1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	Develop an understanding of the key concepts and the significance of disaster management	1	1	1	1	-	-	1	-	-	2	1	-	-	2
2	Understand the occurrences, reasons and mechanism for various types of disaster.	1	1	1	-	-	-	2	1	-	1	1	2	-	1
3	Have a basic understanding of the Disaster Preparedness and Management	1	1	1	-	-	-	1	-	-	1	1	-	-	-
4	Develop a basic under the understanding of Risk assessment, Prevention, Mitigation, Response and Recovery.	1	1	1	1	1	-	1	-	-	1	1	-	-	-
Average		1	1	1	0.5	0.3	-	1.3	0.3	-	1.3	1	0.5	-	0.8