Faculty of Engineering & Technology
Master of Technology (M. Tech)
(W. E. F.: 2023-24)

Document ID: SUTEFETM-01

Name of Faculty	:	Faculty of Engineering & Technology
Name of Program	:	Master of Technology (M. Tech)
Course Code	:	2MTE06
Course Title	:	Steam and Gas Turbine
Type of Course	:	PE
Year of Introduction	:	2023-24

Prerequisite	:	Fundamentals about turbine
Course Objective	:	To be familiar with the mechanical design, configuration, application range and constrains for stem and gas turbine
Course Outcomes	:	At the end of this course, students will be able to:
	CO1	Explain engineering design of thermal systems.
	CO2	Discuss different models used in modelling of thermal systems.
	CO3	Appraise and apply the same to steam turbine design.
	CO4	Determine costing of thermal systems.

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	**T**	**P**	**C**	**SEE**	**CIA**	**SEE**	**CIA**	
03	00	00	03	70	30	00	00	100

Legends: ***L****-Lecture;* ***T****–Tutorial/Teacher Guided Theory Practice;* ***P*** *– Practical,* ***C*** *– Credit,* ***SEE*** *– Semester End Examination,* ***CIA*** *- Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.))*

Course Content

Unit No.	Topics	Teaching Hours	Weightage
1	Unit 1: Steam Turbines Principle and working of steam turbines, type of turbines, impulse and reactions, compounding for pressure and velocity. Velocity triangles for various types, stage to blade, speed ratio for optimum efficiency, diagram efficiency, steam performance. Energy losses in steam turbine, turbine performance at various loads and governing of steam turbines. Constructional details and description of steam turbine components in brief.	5	5%
2	Unit 2: Regenerative feed heating cycles	15	30%

	Introduction : Most Ideal Regenerative feed heating cycle. Regenerative feed heating cycles and their representation on T-s and h-s Diagram. Representation of actual process on T-s and h-s Diagram Regenerative cycles. Other types of feed heating arrangements. Optimum feed water temperature and saving in Heat Rate. Feed Heaters, Direct Contact Heaters, Surface Heaters, Deaerators .		
3	Unit 3: Reheating – Regenerative and Regenerative water – Extraction Cycles Reheating of steam, Practical reheating and Non- reheating cycles, advantage & disadvantages of reheating, regenerative water extraction cycles, practical feed heating arrangements. Feed heating system for 120MW, 200MW, 350MW, 500MW & 66 MW units.	10	25%
4	Mixed Pressure Turbines Low- pressure Turbines, Mixed pressure Turbines, Heat Accumulators	10	25%
5	Unit 5 Gas Turbines Open and closed cycles, constant pressure and constant volume cycles, cycles with inter cooling, reheating and heat exchanger, compressor and turbine efficiencies, pressure losses, performance characteristics of various cycles, practical problems. Jet Propulsion: Calculation of thrust, Power, speed and efficiency, turbo – jet and turbo propulsion systems.	8	15%

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested Learning Websites

Sr. No.	Name of Website
1	https://nptel.ac.in

Reference Books

Sr. No.	Name of Reference Books
1	Arasu Valan A; Thermal Engineering; TMH
2	Nag PK; Basic and applied Thermo-dynamics; TMH
3	Nag PK; Power plant Engineering; TMH
4	Rathakrishnan E; Gas Dynamics; PHI Learning