

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. SEMESTER : VIII

MECHANICAL ENGINEERING

Subject Name: **THERMAL ENGINEERING**

Sr. No.	Course Contents	Total Hrs
1.	Steam Nozzles: Types of nozzles, velocity of steam, discharge through nozzle, critical pressure ratio and condition for maximum discharge, physical significance of critical pressure ratio, effect of friction and nozzle efficiency, general relationship between area, velocity and pressure in nozzle flow, supersaturated flow.	08
2.	Steam turbine : Principle of operation, types of steam turbines, compounding of steam turbines, impulse turbine- velocity diagram, calculation of work, power and efficiency, condition for maximum efficiency, Reaction turbines – velocity diagram , degree of reaction, Parson turbine, work, power, efficiencies, blade height, condition for maximum blade efficiency for Parson turbine, reheat factor, governing of steam turbine- throttle, nozzle and bypass governing, regenerative feed heating, reheating of steam, binary vapour cycle,	13
3.	Gas turbine: Classification, open and closed cycle, gas turbine fuels, actual brayton cycle, optimum pressure ratio for maximum thermal efficiency, work ratio, air rate, effect of operating variables on the thermal efficiency and work ratio, and air rate means of improving efficiency and specific output of simple cycle- open cycle turbine with regeneration, reheating and Intercooling, combined steam and gas turbine plant, requirements of combustion chamber, types of combustion chambers.	12
4.	Jet Propulsion: Turbojet Engine, thrust, thrust power, propulsive efficiency, thermal efficiency, turboprop, ramjet and pulsejet engines, rocket engines.	06
5.	Methods of attachment of blades to turbine rotor; Labyrinth packing. Losses in steam turbine, special types of steam turbine- back pressure, pass out and mixed pressure turbine.	06

Textbooks:

- Thermal Engineering - R.K. Rajput, Laxmi Publication, Delhi
- Steam & Gas turbines- R. Yadav, Central publishing House, Allahabad.
- Thermodynamics & Thermal Engineering – J. Selwin Rajadurai, New Age Publishers, Delhi.
- Thermal Engineering – S. Domkundwar, Dhanpatrai & Co. Delhi.

Reference books:

- Thermal Engineering- Mahesh Rathore, TataMcGraw Hill, Delhi.
- Thermal Engineering – K. Suman, PrenticeHall, New Delhi.
- Thermal Engineering – K.K. Ramalingam, Scitech Publication, Chennai.
- Thermal Engineering – Khurmi & Gupta, S. Chand & Company, Delhi
- Thermal Engineering – S. K. Kulshrestha, Vikas Publishing House Pvt. Ltd, New Delhi.
- Thermal Engineering –P.L. Ballaney, Khanna Publishers, New Delhi
- Thermal Engineering – B. K. Sarkar, Tata McGraw Hill, New Delhi
- Gas Turbines & Propulsive Systems – by Dr. Khajuria & Dubey Dhanpatrai Pub