

## **ME 321 Applied Thermodynamics - I (3-0-0-6)**

**Pre-requisite: ME 211 or equivalent.**

Vapour Power Cycles: Carnot cycle, Rankine cycle, reheat cycle, regenerative cycle, steam cycles for nuclear power plant, back-pressure and extraction turbines and cogeneration, low-temperature power cycles, ideal working fluid and binary/multi-fluid cycles; Steam Generator: subcritical and supercritical boilers, fluidized bed boilers, fire-tube and watertube boilers, mountings and accessories; Condenser; Cooling Tower: hygrometry and psychrometric chart; Steam Turbine: impulse and reaction stage, degree of reaction, velocity triangle, velocity and pressure compounding, efficiencies, reheat factor, governing, nozzles; Heat Pump and Refrigeration Cycles: reversed Carnot cycle and performance criteria, vapour compression and vapour absorption refrigerators, gas cycles, refrigerants and environmental issues; Air-conditioning; Reciprocating Air Compressors: work transfer, volumetric efficiency, isothermal efficiency, multistage compression with intercooling.

*Texts:*

- [1] G. F. C Rogers and Y. R. Mayhew, Engineering Thermodynamics Work and Heat Transfer, 4th Ed., Pearson, 2003.
- [2] T. D. Eastop and A. McConkey, Applied Thermodynamics for Engineering Technologists, 5th Ed., Pearson, 2003.

*References:*

- [1] M. J. Moran and H N Shapiro, Fundamentals of Engineering Thermodynamics, 3rd Ed., John Wiley, 1995.
- [2] M. M. ElWakil, Power Plant Technology, McGraw Hill International, 1992.
- [3] P. K. Nag, Powerplant Engineering, 2nd Ed., Tata McGraw Hill, 2002.