

ME8595 THERMAL ENGINEERING – II

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UNIT I STEAM NOZZLE 9

Types and Shapes of nozzles, Flow of steam through nozzles, Critical pressure ratio, Variation of mass flow rate with pressure ratio. Effect of friction. Metastable flow.

UNIT II BOILERS 9

Types and comparison. Mountings and Accessories. Fuels - Solid, Liquid and Gas. Performance calculations, Boiler trial.

UNIT III STEAM TURBINES 9

Types, Impulse and reaction principles, Velocity diagrams, Work done and efficiency – optimal operating conditions. Multi-staging, compounding and governing.

UNIT IV COGENERATION AND RESIDUAL HEAT RECOVERY 9

Cogeneration Principles, Cycle Analysis, Applications, Source and utilisation of residual heat. Heat pipes, Heat pumps, Recuperative and Regenerative heat exchangers. Economic Aspects.

UNIT V REFRIGERATION AND AIR – CONDITIONING 9

Vapour compression refrigeration cycle, Effect of Superheat and Sub-cooling, Performance calculations, Working principle of air cycle, vapour absorption system, and Thermoelectric refrigeration. Air conditioning systems, concept of RSHF, GSHF and ESHF, Cooling load calculations. Cooling towers – concept and types.

TEXT BOOKS:

1. Kothandaraman, C.P., Domkundwar.S and Domkundwar A.V.," A course in Thermal Engineering", Dhanpat Rai & Sons, 2016.
2. Mahesh. M. Rathore, "Thermal Engineering", 1 st Edition, Tata Mc Graw Hill Publications, 2010.

REFERENCES:

1. Arora.C.P., "Refrigeration and Air Conditioning", Tata Mc Graw Hill, 2008
2. Ballaney. P.L." Thermal Engineering", Khanna publishers, 24th Edition 2012
3. Charles H Butler: Cogeneration" McGraw Hill, 1984.
4. Donald Q. Kern, "Process Heat Transfer", Tata Mc Graw Hill, 2001.
5. Sydney Reiter "Industrial and Commercial Heat Recovery Systems" Van Nostrand Reinholds, 1985.