10 ME 41D TURBOMACHINERY

IV B.Tech I Semester

(with effect from the academic year 2013-2014)

Credits: 4

Lectures/week: 4 Hrs. *Sessional Marks:40*

University Exam:3 Hrs *End Examination Marks: 60*

UNIT-I

Basic Thermodynamics and Fluid Mechanics : Introduction – one dimensional compressible flow equations – Equation of motion –energy equation –Euler's turbine equation – Concept of boundary layers – Isentropic flow with varying area – theoretical volume flow rate – Impulse and Reaction Principles – Compression and expansion efficiencies –stage and overall efficiency.

UNIT-II

Aerofoil Theory and Axial Flow Compressor : Flow over aerofoil sections – Pressure distribution – lift and drag coefficients –effect of compressibility – blade terminology – cascade testing of blades – energy transfer and its losses in terms of lift and drag method – losses in flow passages – analysis of lift and drag method – cascade analysis – characteristic curves – stalling and surging.

UNIT-III

Centrifugal Compressor : Introduction – Principles of operation – losses to compressor – limitations – inlet and impeller design – characteristic curves – chocked flow.

UNIT-IV

Gas Turbine: Classification – ideal and modified cycles – component efficiencies effect of maximum temperature – specific output and cycle efficiency – means of improving the performance of simple open cycle –effect of intercooling, reheat and regeneration – combustion chamber requirements.

UNIT-V

Steam Turbines : Flow through nozzles –effect of Friction –Nozzle performance – Velocity Traingles – Compounding steam turbines – reheat factor – reheating – bleeding – turbine performance at varying loads – throttle and bypass governing – heat drop – mean diameter – speed and number of stages.

TEXT BOOKS:

1. Gas Turbine Theory, Design and Applications : Khjuria, P.R & Dubey, S.P
2. Principles of Turbomachinery : Sheperd, D.J

REFERENCES:

1. Steam Turbine Theory and Practice : Kearton, W.J
2. Gas Turbine Theory : Cohen, H & Roggers, G.F.C.
3. Turbo Machines : Yahya S.M