DEPARTMENT OF MECHANICAL ENGINEERING

III B.Tech, I Semester, Academic Year: 2022-23

Course Name : MACHINE TOOLS AND METROLOGY (16ME1501)
L – T – P : 3 – 1 – 0
Course Instructor :

Time Table

Day/Time	1 09:30 10:20	2 10:20 11:10	3 11:10 12:00	4 12:00 12:50	5 01:40 02:30	6 02:30 03:20	7 03:20 04:00
Monday							
Tuesday							
Wednesday							
Thursday							
Friday							
Saturday							

SYLLABUS

UNIT-I
INTRODUCTION TO TURBOMACHINE

Introduction: Definition of a turbomachine, parts of turbomachines, Comparison with positive displacement machines, Classification, Dimensionless parameters and their significance, Effect of Reynolds's number,

Thermodynamics of fluid flow: Static and Stagnation states- Incompressible fluids and perfect gases, Overall isentropic efficiency, stage efficiency (their comparison) and polytrophic efficiency for both compression and expansion processes.

UNIT-II
ANALYSIS OF TURBOMACHINES

Energy exchange in Turbomachines: Euler's turbine equation, an Alternate form of Euler's turbine equation, Velocity triangles for different values of the degree of reaction.

General Analysis of Turbomachines: Radial flow compressors and pumps – general analysis, Expression for the degree of reaction, velocity triangles.

UNIT-III
STEAM TURBINES

Steam Turbines: Classification, Single stage impulse turbine, condition for maximum blade efficiency, stage efficiency, Need and methods of compounding, Multi-stage impulse turbine, the expression for maximum utilization factor, Reaction turbine – Parsons's turbine, condition for maximum utilization factor, reaction staging. Problems.

UNIT-IV
CENTRIFUGAL AND AXIAL FLOW COMPRESSORS

Centrifugal Compressors, Axial-flow Compressors: Centrifugal Compressors: Stage velocity triangles, slip factor, power input factor, Stage work, Pressure developed, stage

efficiency and surging and problems. Axial flow Compressors: Expression for pressure ratio developed in a stage, work is done factor, efficiencies, and stalling. Problems.

Text Books:

1. Operations Research/S.D Sharma – Kedarnath
2. Introduction O.R/Hiller &Libermann (TMH)

Reference Books:

1. Operations Research/A.M.Natarajan. P.Balasubramani, A. Tamilarasi/Pearson Education.
2. Operations Research Methods & Problems/Maurice Saseini, ArhurYaspan& Lawrence Friedman
3. Operation Research /R.Pannerselvam, PHI Publications.
4. Operation Research/J.K Sharma/MacMilan.

NARSIMHA REDDY ENGINEERING COLLEGE
UGC AUTONOMOUS INSTITUTION
Maisammaguda (V), Kompally - 500100, Secunderabad, Telangana state, India

Accredited by NBA & NAAC with 'A' Grade
Approved by AICTE
Permanently affiliated to JNTUH

LESSON PLAN

Branch: _____ Year: _____ Semester: _____ Section ____ Academic Year: _____

Subject: _____ Sub Code _____

Name of the faculty:

Lecture No.	Date (As per Academic calendar)	Topics to be covered	Actual Date of completion	Remarks
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				

Lecture No.	Date (As per Academic calendar)	Topics to be covered	Actual Date of completion	Remarks
29.				
30.				
31.				
32.				
33.				
34.				
35.				
36.				
37.				
38.				
39.				
40.				
41.				
42.				
43.				
44.				
45.				
46.				
47.				
48.				
49.				
50.				
51.				
52.				
53.				
54.				
55.				
56.				
57.				
58.				
59.				
60.				

Course Instructor **Head of the Dept.** **Principal**