Ch. Ranbir Singh State Institute of Engineering & Technology, Jhajjar
DEPARTMENT OF MECHANICAL ENGINEERING
II Yr. IV Semester (Mechanical Engineering)

LESSON PLAN

Program	:	**B.Tech**
Year & Sem.	:	**II/ IV**
Course No	:	**PCC-ME 202G**
Course Title	:	**Applied Thermodynamics**
Max Marks	:	**75**
No. of Total Lecture	:	**54**
Schedule	:	**3L + 1T = 4**
Lecturer	:	**Dr. Sandeep Singh Kharb**

Recommended Books:

1. Sonntag, R. E, Borgnakke, C. and Van Wylen, G. J., 2003, 6th Edition, Fundamentals of Thermodynamics, John Wiley and Sons.
2. Jones, J. B. and Duggan, R. E., 1996, Engineering Thermodynamics, Prentice-Hall of India
3. Moran, M. J. and Shapiro, H. N., 1999, Fundamentals of Engineering Thermodynamics, John Wiley and Sons.
4. Nag, P.K, 1995, Engineering Thermodynamics, Tata McGraw-Hill Publishing Co. Ltd

Lesson Plan:

Lect. No(s)	Ref. No.	Topics to be covered
		UNITI Introduction to Fuels and Analysis
1	1.1	Basics of Thermodynamics
2	1.2	Introduction to solid, liquid and gaseous fuels
3	1.3	exhaust gas analysis- First law;
4	1.4	analysis of combustion reactions
5	1.5	Heat calculations using enthalpy tables
6	1.6	Adiabatic flame temperature- Chemical equilibrium
7	1.7	equilibrium composition
8	1.8	equilibrium composition calculations using free energy
9	1.9	Numerical Solving
10	1.10	Numerical Solving
		UNITII Power & Refrigeration Cycles
11	2.1	Basics of Vapour Power Cycles
12	2.2	Basics of Rankine Cycle
13	2.3	Vapor power cycles Rankine cycle with superheat,
14	2.4	reheat and regeneration,

15	2.5	exergy analysis Approach
16	2.6	Numerical Solving Rankine Cycle
17	2.7	Numerical Solving Rankine Cycle
18	2.8	Numerical Solving of exergy analysis
19	2.9	Numerical Solving of exergy analysis
20	2.10	Supercritical and ultra super-critical Rankine cycle- Gas power cycles,
21	2.11	Air standard Otto,
22	2.12	Diesel and Dual cycles
23	2.13	Air standard Brayton cycle
24	2.14	effect of reheat, regeneration and intercooling- Combined gas and vapor power cycles-
25	2.15	compression refrigeration cycles, refrigerants and their properties.
26	2.16	Numerical Solving Otto Cycle
27	2.17	Numerical Solving Diesel & Dual Cycle
		UNITIII Psychrometry & Compressible Flow
28	3.1	Properties of dry and wet air,
29	3.2	use of pschyrometric chart, processes involving heating/cooling and.
30	3.3	humidification/dehumidification, dew point
31	3.4	Basics of compressible flow. Stagnation properties,
32	3.5	Isentropic flow of a perfect gas through a nozzle,
33	3.6	choked flow, subsonic and supersonic flows
34	3.7	normal shocks- use of ideal gas tables for isentropic flow
35	3.8	use of ideal gas tables for normal shock flow
36	3.9	Flow of steam and refrigerant through nozzle
37	3.10	super saturation compressible flow in diffusers,
38	3.11	efficiency of nozzle
39	3.12	efficiency of Diffuser
40	3.13	Numerical of Psychrometry
41	3.14	Numerical of Compressible FLow
42	3.15	Numerical Nozzle Efficiency & Diffuser Efficiency
		UNITIV Steam Turbines & Compressors
43	4.1	Reciprocating compressors,
44	4.2	staging of reciprocating compressors,
45	4.3	optimal stage pressure ratio,
46	4.4	effect of intercooling
47	4.5	minimum work for multistage reciprocating compressors
48	4.6	Basics of Steam Turbines
49	4.7	Analysis of Impulse Turbine
50	4.8	Analysis of Reaction Turbine
51	4.9	Velocity Compounding
52	4.10	Pressure Compounding
53	4.11	Numerical Solving
54	4.12	Numerical Solving

(Dr. Sandeep Singh Kharb)
Guest Faculty
Department of ME
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