Lesson Plan

Subject : **Applied Thermodynamics (MEC-202A)**

Lesson plan Duration : 15 Weeks

Work load (lecture) per week : Lectures: 3 hours/Week

Lecture No	Description
1	Brief detail regarding syllabus and overview of subject, books required
2	**Unit-1**: **Steam Generators:** Introduction; classification of boilers; comparison of fire tube and water tube boiler; their advantages.
3	Description of boiler; Lancashire; locomotive; Babcock; Wilcox
4	Boiler mountings; stop valve; safety valve; blow off valve; feed check etc.; water level indicator; fusible plug; pressure gauge
5	Boiler accessories; feed pump; feed water heater
6	Preheater; super heater; economizer; natural draught chimney design
7	Artificial draught; stream jet draught; mechanical draught
8	Calculation of boiler efficiency and equivalent evaporation.
9	Numerical on boiler efficiency.
10	Numerical on chimney design.
11	**Unit-2**, **Vapour Power Cycles:** Simple and modified Rankine cycle
12	Effect of operating parameters on Rankine cycle performance
13	Effect of superheating; effect of maximum pressure
14	effect of exhaust pressure; reheating and regenerative Rankine cycle
15	Types of feed water heater; reheat factor
16	Binary vapour cycle
17	Simple steam engine, compound engine
18	Function of various components
19	Problems

20	problems
21	**Unit -3**: **Steam Nozzle:** Function of steam nozzle; shape of nozzle for subsonic and supersonics flow of stream.
22	Variation of velocity; area of specific volume; steady state energy equation
23	Continuity equation; nozzle efficiency; critical pressure ratio for maximum discharge
24	Physical explanation of critical pressure; super saturated flow of steam
25	Design of steam nozzle. Advantage of steam condensation
26	Component of steam condensing plant; types of condensers
27	Air leakage in condensers; Dalton's law of partial pressure
28	Problems
29	Vacuum efficiency; calculation of cooling water requirement
30	Air expansion pump.
31	**Unit-4: Steam Turbines:** Introduction; classification of steam turbine; impulse turbine
32	Working principle; compounding of impulse turbine; velocity diagram
33	Calculation of power output and efficiency; maximum efficiency of a single stage impulse turbine
34	Design of impulse turbine blade section
35	Impulse, reaction turbine; working principle; degree of reaction.
36	Parsons turbine; velocity diagram
37	Calculation of power output; efficiency of blade height
38	Condition of maximum efficiency
39	Internal losses in steam turbine; governing of steam turbine
40	Numerical & doubts