

# K. D. K. COLLEGE OF ENGINEERING, NAGPUR

Department of Mechanical Engineering

Session 2021 – 2022

Department: Mechanical Engineering Subject: Heat Transfer

Sub. Code No. : BEME601T Period/ Week: 03 + 01

Semester: Sixth Semester

Lecture No.	Teaching Unit Code	Contents
UNIT NO. 01		
1	101	Introduction to layout of thermal power plant,
2	102	principle of steam generation,
3	103	fuel for steam generators, necessity of water treatment,
4	104	Classification of steam generators,
5	105	fire tube and water tube boilers,
6	106	high pressure boilers,
7	107	boiler mountings.
8	108	Boiler accessories.
UNIT NO. 02		
9	201	Draught and its classification,
10	202	calculations for chimney height,
11	203	chimney diameter & efficiency.
12	204	chimney diameter & efficiency.
13	205	Condition for maximum discharge.
14	206	Performance of steam generators: Evaporation capacity,
15	207	Performance of steam generators: equivalent evaporation,
16	208	Performance of steam generators: boiler efficiency.
UNIT NO. 03		
17	301	Fluidized bed boiler: Bubbling fluidized bed boilers,
18	302	circulating fluidized bed boilers (Elementary treatment expected),
19	303	coal handling,
20	304	ash handling.
21	305	Cogeneration: Introduction to cogeneration,
22	306	Need, working principle and applications.
23	307	Topping cycle
24	308	bottoming cycle.
UNIT NO. 04		
25	401	Steam nozzles: Adiabatic expansion in nozzles,
26	402	maximum discharge, critical pressure ratio
27	403	effects of friction,
28	404	calculation of throat and exit areas,
29	405	supersaturated flow, Wilson Line.
30	406	Steam turbines: Working principle of steam turbines,
31	407	classification of steam turbines, comparison of impulse and

		reaction turbines,
32	408	compounding of steam turbines, governing of turbines.
UNIT NO. 05		
33	501	Energy losses in steam turbines,
34	502	flow of steam through turbine blades, reheat factors,
35	503	velocity diagrams, graphical and analytical methods,
36	504	work done, thrust and power,
37	505	dimensions and proportioning of the blades,
38	506	steam turbine efficiencies,
39	507	condition for maximum efficiencies,
40	508	reheat and regenerative cycles.
UNIT NO. 06		
41	601	Steam condensers: Types of condensers,
42	602	classification of condensers,
43	603	quality and quantity of cooling water required,
44	604	calculations for surface condenser,
45	605	Dalton's law of partial pressure, sources of air leakages and air removal, air ejectors.
46	606	Cooling towers: wet cooling towers,
47	607	dry cooling towers,
48	608	cooling ponds.