

KIIT POLYTECHNIC
Metallurgical Engineering Department

LESSON PLAN

Session :: Winter– 2022
Course Type :: Theory
Semester/Branch :: 5th Semester, Metallurgical Engineering
Subject (with code) :: Ferrous Metallurgy - II (Th-4)
Contact hours/week :: 4 hours
Name of Faculty :: Deepak Kumar Patra

SL. No.	CLAS S ID	COURSE CONTENT	MODE OF DELIVERY	EXHIBIT/ REFERENCE
1	1	Introduction to steel making.	Lecture (Elaboration)	Study material
2	2	Brief history of principles of steel making & processes of steel making.	Lecture (Explanation)	Study material
3	3	Bistre steel making, shear steel making.	Lecture (Explanation)	Steel Making by R.H.Tupkary
4	4	Crucible steel making, Bessemer steel making.	Lecture (Explanation)	Steel Making by R.H.Tupkary
5	5	Open hearth steel making.	Lecture (Explanation)	Steel Making by R.H.Tupkary
6	6	Assignment & summarise		

7	7	Different reactions involved in steel making.	Collaborative thinking	Study material
8	8	Differentiation between acid process & basic process of steel making.	Collaborative thinking	Study material
9	9	Explanation of the principles and conditions required in removal of „P“, „S“, Si“, „Mn“ and „C“ in steel making.	Lecture (Explanation)	Study material
10	10	List of the different raw materials required for steel making.	Lecture (Explanation)	Study material
11	11	Discussion on the important raw materials available in India.	Lecture (explanation)	Steel Making by R.H.Tupkary
12	12	Assignment & summarise		
13	13	Different raw materials of LD process.	Lecture (explanation)	Study material
14	14	Explanation the construction and operation of LD converter.	Lecture (explanation)	Study material
15	15	Describe the refining reaction in LD converter with reference to decarburization and dephosphorisation.	Guided thinking	Study material
16	16	Mention the quality of steel and composition of slag in LD process.	Lecture (explanation)	Steel Making by R.H.Tupkary
17	17	Advantages and limitations of LD process.	Guided thinking	Steel Making by R.H.Tupkary
18	18	Bottom, top and combined blowing.	Lecture (Explanation)	
19	19	Multi nozzle converter, explain OLP process	Lecture (Explanation)	Steel Making by R.H.Tupkary
20	20	Explanation of the principle, types of slags prepared by electric arc furnace.	Lecture (Explanation)	Steel Making by R.H.Tupkary
21	21	Explain the steps of electric arc furnace heating to produce steel.	Lecture (Explanation)	Study material
22	22	Advantages of electric arc furnace process.	Guided thinking	Study material
23	23	Advantages and limitations of induction furnace process	Guided thinking	Study material
24	24	Assignment & summarise		
25	25	The principle of operation, merits and demerits of the recent steel making process like Ajax Process.	Lecture (Elaboration)	Steel Making by R.H.Tupkary
26	26	The principle of operation, merits and demerits of the recent steel making process like OBM Process.	Guided thinking	Study material

27	27	The principle of operation, merits and demerits of the recent steel making process like Spray steel making Process.	Guided thinking	Study material
28	28	Explain different De-Oxidisers and their use.	Lecture (Explanation)	Steel Making by R.H.Tupkary
29	29	Explanation of rimming steel.	Lecture (Explanation)	Study material
30	30	Explanation of semi-killed steel, explanation of killed steel.	Lecture (Explanation)	Study material
31	31	Differentiate between killed steel semi killed steel and rimming steel.	Lecture (Explanation)	Study material
32	32	Direct pouring.	Flipped class	Study material
33	33	Tundish teeming.	Prompt and cue	Study material
34	34	Bottom teeming	Prompt and cue	Study material
35	35	Describe different ingot defects, their causes and remedies.	Collaborative thinking	Study material
36	36	Describe different ingot defects, their causes and remedies.	Collaborative thinking	Study material
37	37	Assignment & summarise		
38	38	Explain the principle and operation of continuous casting.	Video presentation	Study material
39	39	Describe different types of casters.	Video presentation	Steel Making by R.H.Tupkary
40	40	Describe different types of casters.	Video presentation	Steel Making by R.H.Tupkary
41	41	Describe about the moulds and mould maintenance in continuous casting.	Video presentation	Steel Making by R.H.Tupkary
42	42	Discuss advantages of continuous casting.	Video presentation	Study material
43	43	Continuous casting of Billets, Blooms and Slabs.	Lecture (Explanation)	Study material
44	44	Assignment & summarise		
45	45	Explain the principle operation and advantages of secondary steel making process such as VAD Process.	Lecture (Explanation)	Study material
46	46	Explain the principle operation and advantages of secondary steel making process such as VOD	Lecture (Explanation)	Study material

		Process.		
47	47	Explain the principle operation and advantages of secondary steel making process such as AOD Process.	Lecture (Explanation)	Study material
48	48	Describe the stream degassing process.	Lecture (Explanation)	Study material

Signature of faculty