Lesson Plan For

Industrial Metallurg (2023-24)

Department of Metallurgical Engineering

UGIE Rourkela

Discipline: **Metallurgical Engineering**

Subject: **Industrial Metallurgy (TH-3)**

Semester: **6th**

Total Period allotted: **75**

Period per week: **5**

Name of the Teaching Faculty: **Amarjit Mohanta**

Week	Class No.		Lecture Topics
1	1	Chapter -1: Classification of Welding Processes	Classification of different welding process
	2		Classification of different welding process
	3		Pressure Welding Processes
	4		Non-Pressure Welding Processes
2	5	Chapter -2: Gas Welding	Different types of flames in gas welding
	6		Gas Welding Equipment's
	7		Gas Welding Equipment's
	8		Advantages of Gas Welding, Disadvantage of Gas Welding
	9		Application of Gas Welding
3	10	Chapter-3: Arc Welding	Introduction to Describe various arc welding process
	11		Metallic Arc
	12		Submerged Arc
	13		TIG Welding

	14		MIG Welding.
4	15	Chapter-4: Thermit Welding	The principle of Thermit Welding
	16		Procedure of Thermit Welding
	17		Advantages and disadvantages of Thermit welding.
	18		Class Test
5	19	Chapter-5:Resistance Welding	Introduction to Resistance welding
	20		Working Principle of Resistance Welding
	21		Types of Resistance welding
	22		Application of Resistance Welding
6	23	Chapter - 6 : Welding of Steel C.I & Cu. Alloys	Precaution required for welding of steel
	24		Joint design and techniques required for C.I Welding
	25		Describe the welding of copper and its alloy
	26		Describe the welding of copper and its alloy
	27		Describe the welding of copper and its alloy
7	28	Chapter - 7 : Metallurgy of Welding	The temperature distribution in we1dng of steel.
	29		The structural changes in weld metal and parent metal after welding.
	30		Weldability, various methods for testing welding joints.

	31		Different welding defects.
8	32	Chapter - 8 : Brazing & soldering	Brazing principle and procedure
	33		Various brazing methods
	34		Soldering steps
	35		Various types of solders
9	36	Chapter - 9 : Scope of Powder Metallurgy	Define powder metallurgy.
	37		Depict the historical development of powder metallurgy.
	38		Mention advantages disadvantages and applications of P/M
	39		Briefly describe primary and secondary characteristics of powders.
10	40	Chapter – 10 : Methods of Powder Production	Different methods of powder production
	41		Different methods of powder production
	42		Different methods of powder production
	43		Different methods of powder production
	44		Different methods of powder production
11	45		The mechanical, physical, chemical and electro chemical methods.
	46		The mechanical, physical, chemical and electro chemical methods.
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	48		Class Test
	49		Class Test

12	50	Chapter – 11: Compaction of Metal Powders	Give the significance and different methods of conditioning.
	51		Explain different die-compaction techniques
	52		Describe isostatic pressing with advantages, limitation applications.
	53		Give brief outline on continuous compaction.
	54		Advantages and Disadvantages of continuous compaction
13	55	Chapter – 12: Sintering of Metal Powders	Define sintering and Explain its various stages.
	56		Define sintering and Explain its various stages.
	57		Explain briefly mechanism of sintering process.
	58		Explain briefly mechanism of sintering process.
	59		Explain the process variables and furnaces used for sintering
14	60		Explain the process variables and furnaces used for sintering
	61		Give a note on liquid phase sintering.
	62		Give a note on liquid phase sintering.
	63		Solid Phase sintering
	64		Solid Phase sintering
15	65	Chapter – 13: Flow Sheets of Production of P/M Components	Porous bearing
	66		Porous bearing
	67		Sintered friction materials

	68		Sintered carbides
	69		Magnetic Materials
16	70		Cermets
	71		Dispersion strengthened materials
	72		Class Test
	73		Revision
	74		Revision