

Discipline: <b>Metallurgical Engineering</b>		Semester: <b>4<sup>th</sup></b>	Name of the Teaching Faculty: <b>Deepika Naik</b>	
Subject: <b>Principal extractive metallurgy (TH-03)</b>		No. of days/per week class allotted: <b>4</b>	Semester from Date: <b>16. 01. 2024</b> to Date: <b>26.04.2024</b> No. of weeks: <b>15</b>	
<b>Week</b>	<b>Class No.</b>		<b>Lecture Topics</b>	
1	1	Chapter -1: Defination of Metallurgy Terms	Definition of metallurgical terms	
	2		Definition of ores and minerals	
	3		Definition of gangue, flux and slag	
	4		Definition of matte, speiss, metals and alloys	
2	5	Chapter-2: Principal of pretreatment of ores for metal extraction	-do-	
	6		Discussion on possible questionnaire	
	7		Explanation of drying	
3	8	Chapter-2: Principal of pretreatment of ores for metal extraction	Definition of calcinations and its explanation	
	9		Definition of agglomeration process and different types of it	
	10		-do-	
	11		Explanation of briquetting process	
4	12	Chapter-2: Principal of pretreatment of ores for metal extraction	Explanation of nodulising process	
	13		Explanation of vacuum extrusion process	
	14		Explanation of sintering process	
	15		Explanation of pelletizing process	
	16		-do-	
5	17	Chapter-3: General methods and principles of extraction	Introduction to General Methods of Extraction	
	18		Explanation of pyrometallurgical process	
	19		Explanation of roasting and different roasting methods	
	20		Explanation of Ellingham diagram (oxides)	
6	21	Chapter-3: General methods and principles of extraction	Explanation of predominance area diagram (sulphides)	
	22		Explanation of smelting and different smelting practices	
	23		Explanation of flash smelting, Hearth smelting and Matte smelting	
	24		Explanation of distillation and	

			sublimation	
7	25	Chapter-4: Basic approaches to refining	Converting of matte	
	26		Converting of pig iron	
	27		Explanation of hydrometallurgical process	
	28		Explanation different stages of hydrometallurgical process	
8	29			Flow diagram of hydrometallurgical process
	30			Explanation of leaching and different leaching methods
	31			Bacteria leaching and pressure leaching
	32			Discussion on possible questionnaire
9	33		Explanation of electrometallurgical process	
	34		Definition of electrolysis, ionic conductivity, EMF series	
	35		Faraday's law of electrolysis	
	36		Explanation of faraday's 1 <sup>st</sup> law	
10	37	Chapter-5: Principles of metal extractions	Explanation of faraday's 2 <sup>nd</sup> law	
	38		Explanation of electro wining and electro refining	
	39		Discussion on possible questionnaire	
	40		Introduction to basic approaches to refining	
11	41			Explanation of refining process
	42			Explanation of zone refining process
	43			Explanation of fire refining process
	44			Quiz test
12	45	Chapter- 6:principles of metallurgical thermodynamics reaction kinetics	Introduction to principal of metal extraction	
	46		Principles of metallurgical thermodynamics, Zeroth law	
	47		1 <sup>st</sup> law of thermodynamics	
	48		2 <sup>nd</sup> law of thermodynamics	
13	49			3 <sup>rd</sup> law of thermodynamics
	50			Concept of internal energy, entropy, enthalpy change and free energy
	51			Application of thermodynamics laws to metallurgical process
	52			Henry's law
14	53		Sivert's law	

15	54		Introduction to reaction kinetics
	55		First order reaction kinetics
	56		Application of 1 <sup>st</sup> order reaction to metallurgical processes
	57		Radioactive decay and half life period
	58		Revision Class-I
	59		Revision Class-II
	60		Important question discussion

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16/01/2024

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