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KHULNA POLYTECHNIC INSTITUTE

MECHANICAL TECHNOLOGY-70

SUBJECT: METALLURGY (27043)

SEMESTER PLAN

THEORY

MARKS DISTRIBUTION			
TC	TP	PC	PF
40	60	25	25

WEEK	CLASS	ART	DESCRIPTIONS	REMARKS
1	1/1	1.1-1.3	Define Metallurgy, Classify Metallurgy, State the importance of Metallurgy in the practical field of Engineering sector.	
	2/2	1.4-1.5	Describe the metallurgical structure of metals, mention the physical and mechanical properties of metals.	
2	1/3	2.1-2.3	Define ores of metals, classify ores of metals, describe the processing of ores before melting.	
	2/4	2.4-2.6	Describe metallic ores available in Bangladesh, define refractory materials, describe different types of refractories.	
	3/5	2.7-2.9	State Characteristic of good refractories, state function of refractories, state refractories materials used in different furnaces.	
3	1/6	3.1-3.4	Define pig iron, mention the composition of pig iron, define furnace, state considering factors to identify furnace.	
	2/7	3.5-3.7	State various types of metal melting furnaces, describe the importance of Blast furnace, state construction of Blast furnace.	
4	3/8	3.8-3.10	Explain the operation of the Blast furnace, describe the chemical reaction caused in the blast furnace for pig iron production, describe the elements of slag use in of blast furnace.	
	1/9	4.1-4.2	Define wrought iron, mention the composition of wrought iron.	CLASS TEST 1
5	2/10	4.3-4.4	State the properties of wrought iron, state uses of wrought iron.	
6	3/11	4.5-4.6	State manufacturing process of wrought iron, state safety process in manufacturing process of wrought iron.	QUIZE TEST 1
	1/12	5.1-5.3	Define cast iron, classify the cast iron, mention the composition of various cast iron.	
7	2/13	5.4-5.5	Mention the properties of various cast iron, explain the manufacturing process of cast iron.	
	3/14	5.6-5.7	Describe effect of Sulphur, Phosphorous. Aluminum, Silicon on the properties of cast iron, Explain the domestic and industrial uses of cast iron.	
8	 MID SEMESTER EXAMINATION 			
9	1/15	6.1-6.2	Define plain carbon steel, mention the type of plain carbon steel.	
	2/16	6.3-6.4	Mention the composition of plain carbon steel, state uses of different plain carbon steel (1st half part).	
10	3/17	6.5	State uses of different plain carbon steel (next half part), describe process of making steel adapted in Bangladesh	
	1/18	7.1-7.2	Describe the construction of Bessemer converter, distinguish between the basic Bessemer process and acid Bessemer process of making steel.	
11	2/19	7.3-7.4	Describe the construction of Open-Hearth furnace, describe the steel production using Open-Hearth Furnace.	
	3/20	7.5-7.6	Mention the construction of Crucible, mention the Crucible process of making steel.	
12	4/21	7.7-7.8	Explain the advantage of making steel by Crucible process and other process, state the reason of adopting the duplexing and tripling process of making steel.	
	1/22	8.1-8.2	Explain the construction of Electric Furnace, mention the classification of Electric Furnace.	

	2/23	8.3-8.4	Mention the process of making steel by direct arc Electric Furnace, describe the process of making steel by Induction Electric Furnace (1st half part).	
13	3/24	8.5	describe the process of making steel by Induction Electric Furnace (next half part), mention the reason for superiority of Electric Furnace steel than others.	CLASS TEST 2
	1/25	9.1-9.2	State the purpose & types of alloy steel, differentiate between alloy steel and plain carbon steel.	
	2/26	9.3-9.4	Describe the composition of stainless-steel, high-speed steel, tungsten steel, molybdenum steel. chromium steel, nickel steel and silicon steel, describe the effect of Mn, W, Mo, Cr, Ni, V, Cu, S, P, and Si on the Mechanical properties of alloy steel.	
14	3/27	9.5-9.6	Describe the domestic and industrial uses of stainless-steel, high-speed steel, tungsten steel, molybdenum steel, chromium steel, nickel steel and silicon steel mention the properties of Aluminum and Copper	QUIZE TEST 2
	4/28	9.7-9.8	Describe the uses of Al, Cu, Zn, Sn and pb, define alloy of metals.	
	5/29	9.9-9.10	Describe the compositions, properties and uses of important alloys of Al, Cu, Zn, Sn, Pb, Sb and Ni, mention the extraction process of Al, Cu, Zn, Sn and Pb.	
15	1/30	10.1-10.3	Define power metallurgy, list the importance of powder Metallurgy, explain the methods of producing metal powder	
	2/31	10.4-10.5	State the methods of production of metal powder, describe the special properties of metal powder products	
	3/32	10.6-10.7	State the applications of metal powder products, mention the advantages and disadvantages of metal powder products.	
16			REVIEW OF CLASS	

PRACTICAL OF METALLURGY

SERIAL NO	CLASS 3 PERIOD	EXPERIMENT NAME WITH WORKING PROCESS	REMARKS
01		Practicing OSH in details.	
02		Identify various types of metals.	
03		Sketch different types of metal structure.	
04		Hardness test using Rockwell machine.	
05		Hardness test using Brinel machine.	
06		Identify Ferrous & nonferrous metals.	
07		Identify various types of alloy steel.	
08		Determine structure by Microscope.	
09		Show the operation of Electric furnaces.	
10		Reviews from the learner	

SUBROTO SAHA

HEAD OF THE DEPARTMENT

MILAN

CLASS TEACHER