

Lesson Planning

Name of Faculty :Sudha Rani
Dicipline : Mechanical Engg.
Subject : MATERIALS & METALLURGY
Lesson Plan duration : 48 Hours
Work load (Lecture/Practical) per week (in hours): 3L and 2P

Week	Theory		Topic	Remarks
	Lecture day	Topic(Including assignment/test)		
1		UNIT - 01, Introduction	1. Classification of about 25 specimens of materials/machine parts into	
	1	Material, Engineering materials, History/Timeline of Material Origin,		
	2	Scope of Material Science, Overview of different engineering materials applications, Importance, Classification of materials,		
2	3	Assignment-I	(i) Metals and non metals (ii) Metals and alloys (iii) Ferrous and non ferrous metals (iv) Ferrous and non ferrous alloys	
	4	Mechanical properties of various materials,		
	5	Present and future needs of materials		
3		UNIT-02, Crystallography	2. Given a set of specimen of metals and alloys (copper, brass, aluminium, cast iron, HSS, Gun metal); identify and indicate the various properties possessed by them.	
	7	Fundamentals: Crystalline solid and amorphous solid, Unit Cell		
	8	Space Lattice, Arrangement of atoms in Simple Cubic Crystals		
4	9	BCC, FCC and HCP Crystals, Number of atoms per unit	3. a) Study of heat treatment furnace. b) Study of a thermocouple/potometer	
	10	Defects/Imperfections, types		
	11	effects in Solid materials.		
5	12	Overview of deformation behaviour and its mechanisms,	4. Study of a metallurgical microscope and a specimen polishing machine.	
		UNIT-03, Metallurgy		
	13	Introduction, Cooling curves of pure metals,		
6	14	Sessional-I	5. To prepare specimens of following materials for microscopic examination and to Examine the microstructure of the specimens of following materials At least any two) i) Brass ii) Copper iii) Cast Iron , iv) Mild Steel v) HSS, vi) Aluminium	
	15	dendritic solidification of metals,		
		UNIT-04, Metals And Alloys		
7	16	Ferrous Metals: Different iron ores	6. To anneal a given specimen and find out difference in hardness as a result of annealing.	
	17	Assignment-II		
	18	PTM		
8	19	allotropic forms of iron- Alpha, Delta,	7. To normalize a given specimen and to find out	
	20	Gamma. Basic process of manufacturing of pig iron and steel-making.		
	21	Cast Iron: Properties, types of Cast Iron, manufacture and their use.		
9	22	Classification of plain carbon steels,		
	23	Properties and application of different types of Plain Carbon Steels		
	24	Effect of various alloying elements on properties of steel,		
10	25	(high speed steel, stainless steel, silicon steel, spring steel)		
	26	Concept of moment of resistance		
	27	Non Ferrous Materials: Properties and uses of Copper		
11	28	Sessional-II		
	29	Revision		
		UNIT-05, Heat Treatment		
12	30	Definition and objectives of heat treatment,		
	31	Formation and decomposition of Austenite		
	32	Martensitic Transformation. Various heat treatment processes-		
	33	PTM		
	34	carburizing, nitriding, cyaniding. Hardenability of Steels,		

12	35	Types of heat treatment furnaces (only basic idea),	the difference in hardness as a result of normalizing.	
	36	measurement of temperature of furnaces.		
13	37		8. To harden and temper a specimen and to find out the difference in hardness due to tempering.	
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	39	Assignment-III		
14		UNIT-06,Advanced Materials		
	40	Heat Insulating materials- Asbestos, glasswool, thermocole.		
	41	Ceramics-Classification, properties, applications		
	42	Refractory materials –Dolomite, porcelain.		
15	43	Revision	9. Demo of welding defects like sensitization and microfissure in stainless steel.	
	44	Revision		
	45	Revision		
16	46	Revision		
	47	Revision		
	48	Revision		