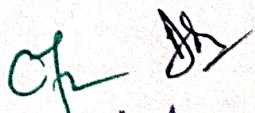


Detailed Teaching Plan

Disciplin		Semester:		Class room Instruction Start Date:					
S.N o.	Cha pter No.	Topics	Sub Topic to be covered under this unit	Total hour s	No. of periods planned	Planned date	Executio n Date	Remarks if any	
1	1	Properties and Structure of Engineering Materials	Classification of engineering materials – Metals and Non-metals. Properties of engineering materials Physical, Thermal, Electrical, Magnetic and Mechanical properties	6	1	2/9/24	3/3/24		
2			Structure of crystalline solids: Concept of Amorphous and crystalline structure, Crystallization of liquid into solid state, nucleation and growth, formation of polycrystalline and single crystals,		1	26/24	10/9/24		
3			effect of grain size on material properties.		1		11/9/24		
3			Crystal Structure – space lattice, unit cell, BCC, FCC, HCP, lattice		1	21/9/24	12/9/24	A.I.	
4			Structural imperfections: impurity atoms, point imperfection, line imperfection, dislocations, surface imperfection, volume defects		2		18/9/24		
5			Metallurgical microscope, its use and care		1		19/9/24		
6	2	Plastic deformation	Elastic and Plastic deformation	12	2		20/9/24		
7			Mechanisms of deformation in crystalline materials – Slip and Twinning		2		21/9/24		
8			Stress – Strain curves for polycrystalline materials		2	23/9/24	23/9/24		
9			Yield point phenomena		2		25/9/24	A.I.	
10			Strain hardening		2		to	26/9/24	
11			Recovery, recrystallisation and grain growth		2	26/9/24	28/9/24		
12			Concept, definitions and need. Solid Solution – Types		1		30/9/24		

13	3	Phase diagrams	Alloy – need for alloying, effect on material properties	7	1	11/10/24		
14			Cooling curves and their importance.		1	03/10/24		
15			Types of phase equilibrium diagram - monotectic, Eutectic, Hyper eutectic, hypoeutectic, eutectoid, Hyper and Hypo eutectoid, peritectic and peritectoid system.		1	4/10/24		
16			Iron-carbon equilibrium diagram: Development of microstructure in Iron- Carbon system,		2	11/10/24	5/10/24	
17			Allotropic transformations in Iron and Steel			15	9/10/24	
17			Microstructure examination: Preparation of micro- specimen, selecting the specimen, grinding and polishing, Etching and etching reagents. use and care of microscope		1	16/10/24	14/10/24	
18			4		Metallic Materials	Micro- Structure, Properties and application, designation and coding methods of:	8	2
19	Cast Iron: Gray, White, Malleable, Nodular Cast iron.	2		16		16/10/24		
20	Steels: Low, medium and high carbon steels, Stainless steel, High speed steel, Tool steel, Alloy steels	2		12/10/24		17/10/24		
21	Copper, Aluminum, Zinc and their alloys, Bearing materials, Alloying elements	2				22/10/24		
22	5	Non-metallic Materials	Polymers: Types, properties and industrial applications	8	2	5/10/24		
23			Ceramic and refractory: Types, properties and applications		2	14/10/24	18/10/24	
24			Composites: types, properties and applications.		2	15	19/10/24	
25			Nano and Smart materials: Definition, types - piezoelectric, thermoresponsive, shape memory alloys, polychromic, chromogenic or halochromic materials, Applications		2	27/10/24	20/10/24	A2

26	6	Heat treatment of Steels	Introduction, purpose and advantage of heat treatment	11	1	28/12/24	27/11/24	
27			TTT Curve: Significance and construction of TTT curve for eutectoid steel		2	to	28/11/24	
28			Introduction to Pearlitic, Bainitic and Martensitic Transformation		2		29/11/24	
29			Heat treatment processes: Annealing, Normalizing, Hardening, Tempering, Surface and Case hardening		4	3/12/24	30/11/24	
30			Heat treatment furnaces: Muffle furnace, Box type furnace		2		1/12/24	
31	7	Testing of Materials	Destructive and non-destructive testing	5	1	3/12/24	3/12/24	
32			Destructive testing - Hardness test (Brinell, Rockwell and Vickers)		2	to	3/12/24	
33			Non-destructive testing- Magnetic particle crack detection test, Dye penetration test, Ultrasonic test, Radiography test, Eddy current testing		2	6/12/24	4/12/24	
				57	57			


Principal
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 Raipur (C.C.)