

Government Polytechnic Arwal, Arwal

LECTURE PLAN

DIPLOMA SEMESTER 3RD

Subject(code) : Mechanical Engineering Materials (1625304)					
Name : Dhananjay kumar					
Department of Mechanical Engineering					
Units	Topics	Lecture No.	Weeks	Lecture Modes	Remarks
1. Engineering Materials and their Properties	1.1 Introduction, Classification and Application of Engineering materials	1	1	Google meet/ video/pdf/ppt	
	1.2 I.S specification of materials –plain carbon iron, low alloy steel & bearing materials, properties of metals.	2		Google meet/ video/pdf/ppt	
	1.3 Mechanical properties :- Strength, elasticity, ductility, malleability, plasticity, toughness, hardness, brittleness, hardenability, fatigue, thermal conductivity, thermal expansion.	3		2	Google meet/ video/pdf/ppt
		4			
		5			
	1.4 Introduction to Corrosion, types of Corrosion, Corrosion resisting materials.	6	7	Google meet/ video/pdf/ppt	
		7			
2. Ferrous Metals and Alloys	2.1 Characteristics and application of ferrous material, flow diagram for production of Iron and steel,	8	3	Google meet/ video/pdf/ppt	
		9			
	2.2 Effect of sulphur, silicon and phosphorous	10		Google meet/ video/pdf/ppt	
	2.3 Iron and Iron carbide diagram	11	Google meet/ video/pdf/ppt		
	2.4 Classification, composition and application of plain carbon steel	12	Google meet/ video/pdf/ppt		
	2.5 Alloy steels:-low alloy steel, high alloy steel, stainless steel	13	4	Google meet/ video/pdf/ppt	
	2.6 Effect of various alloying elements – chromium, nickel, manganese, molybdenum, tungsten, vanadium.	14		Google meet/ video/pdf/ppt	
	2.7 Tool steels:- High speed steel, punches, hot and cold working.	15		Google meet/ video/pdf/ppt	
	2.8 Magnetic materials :- properties and application	16		Google meet/ video/pdf/ppt	
2.9 Special cutting tool materials – diamond, stellites & tungsten	17	18	Google meet/ video/pdf/ppt		
3. Non-Ferrous Metals and Alloys	3.1 Properties, application & composition of copper alloys (naval brass, muntz metal, gun metal, bronzes), aluminium alloys- duralumin				18
		19			

3. Non-Ferrous Metals and Alloys	3.2 properties of bearing materials	20	5	Google meet/video/pdf/ppt		
4. Heat treatment of steels	4.1 Heat treatment processes –Annealing, Normalizing, hardening, Tempering, principle, advantages, limitations and application	21	6	Google meet/video/pdf/ppt		
		22				
		23				
	4.2 Surface Hardening – i) case hardening ii) flame hardening	24		7	Google meet/video/pdf/ppt	
		25				
	4.3 iii) Induction hardening iv) Nitriding v) Carburizing	26		8	Google meet/video/pdf/ppt	
27						
5. Non metallic materials	5.1 Polmeric materials – Introduction, types, properties	28	9	Google meet/video/pdf/ppt		
	5.2 Thermoplastic Plastics – characteristics and uses of ABS, acrylics, nylons, vinyls	29		Google meet/video/pdf/ppt		
		30		Google meet/video/pdf/ppt		
	5.3 Thermosetting plastics – characteristics and uses of polyesters, epoxies, bakelites	31		Google meet/video/pdf/ppt		
		32		Google meet/video/pdf/ppt		
	5.4 Rubbers – Neoprene, butadiene, Buna & silicon	33		10	Google meet/video/pdf/ppt	
		34			Google meet/video/pdf/ppt	
	5.5 Properties and application od ceramics, abrasive, adhesive and insulating material – cork, asbestos, termocole, glass wool	35		11	Google meet/video/pdf/ppt	
36		Google meet/video/pdf/ppt				
6. Powder metallurgy & Non destructive testing	6.1 Advantages, limitations, application of powder metallurgy	37	12	Google meet/video/pdf/ppt		
		38		Google meet/video/pdf/ppt		
	39	Google meet/video/pdf/ppt				
	6.2 Blending, compacting, sintering, infiltration & impregnation	40	11	Google meet/video/pdf/ppt		
		41		Google meet/video/pdf/ppt		
	6.3 Application of powder metallurgy for tungsten carbide tip tool and porous bearing	42	12	Google meet/video/pdf/ppt		
		43		Google meet/video/pdf/ppt		
	6.4 Introduction of non destructive testing, Difference between destructive and non destructive testing	44	12	Google meet/video/pdf/ppt		
		45		Google meet/video/pdf/ppt		
		46		Google meet/video/pdf/ppt		
6.5 Non destructive testing methods – Radiography, Ultrasonic crack detection Dye penetration test, magnaflux test	47	12	Google meet/video/pdf/ppt			
	48		Google meet/video/pdf/ppt			
	49		Google meet/video/pdf/ppt			