

JHARSUGUDA ENGINEERING SCHOOL, JHARSUGUDA

Department of Mechanical Engineering

Name of the Faculty: A. BARA, K. PRADHAN	Session: 2022-23
Course code.:	Course Name: ENGINEERING MATERIAL
Programe: Diploma	Department: Mechanical Dept.
Semester: 3rd	Section: M1 & M2
Branch: MECHANICAL	

Week	Periods	Unit	Hours	Topic to be Covered
1	5	1	1	Material classification into ferrous and non ferrous category and alloys
			1	Properties of Materials: Physical , Chemical
			1	Properties of Materials: Mechanical
			1	Performance requirements
			1	Material reliability and safety
2	5	2	1	Characteristics and application of ferrous materials
			1	Classification carbon steel , composition and application of low carbon steel, medium carbon steel and High carbon steel
			1	Alloy steel: Low alloy steel, high alloy steel,
			1	Alloy steel: tool steel and stainless steel
3			1	Effect of various alloying elements such as Cr, Mn, Ni, V, Mo on steel
			1	phase diagram
4	8	3	1	phase diagram
			1	cooling curves
			1	cooling curves
			1	Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel
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			1	Crystal defines, classification of crystals, ideal crystal and crystal imperfections
			1	Classification of imperfection: Point defects, line defects

6	10	4	1	Classification of imperfection: surface defects and volume defects
7			1	causes of point defects: Vacancies
			1	causes of point defects: Interstitials and impurities
			1	causes of line defects: Edge dislocation
			1	causes of line defects: screw dislocation
			1	Effect of imperfection on material properties
			1	Deformation by slip and twinning
			1	Effect of deformation on material properties
8	10	5	1	Purpose of Heat treatment
			1	Process of heat treatment: Annealing
			1	Process of heat treatment: normalizing,
			1	Process of heat treatment: hardening
9			1	Process of heat treatment: tempering, stress relieving measure
			1	Surface hardening: Carburizing
			1	Surface hardening: Nitriding
			1	Effect of heat treatment on properties of steel
10			1	Effect of heat treatment on properties of steel
			1	Hardenability of steel
	10	6	1	Aluminum alloys: Composition, property
			1	usage of Duralmin, $\gamma$ - alloy
11			1	Copper alloys: Composition, property
			1	usage of Copper Aluminum, Copper-Tin
			1	usage of Babbit, Phosphorous bronze
			1	usage of brass, Copper- Nickel
			1	Predominating elements of lead alloys, Zinc alloys and Nickel alloys
12			1	Low alloy materials like P-91, P-22 for power plants and other high temperature services
			1	High alloy materials like stainless steel grades of duplex
			1	High alloy materials like stainless steel grades of super duplex
	3	7	1	Classification, composition, properties and uses of Copper base material
13			1	Classification, composition, properties and uses of lead, tin base material
			1	Classification, composition, properties and uses of Cadmium base material
	3	8	1	Classification, composition, properties and uses of Iron base spring material
			1	Classification, composition, properties and uses of Iron base spring material

14	3	9	1	Classification, composition, properties and uses of Copper base spring material
			1	Properties and application of thermosetting polymers
			1	Properties and application of thermoplastic polymers
			1	Properties of elastomers
15	3	10	1	Classification, composition, properties and uses of particulate based and fiber reinforced composites
			1	Classification, composition, properties and uses of particulate based and fiber reinforced composites
			1	Classification and uses of ceramics

  
signature of faculty

  
signature of i/c HOD