Badriprasad Institute of Technology, Sambalpur

Lesson plan for Theory -3, Engineering Materials

Semester & Branch: 3rd Sem. Mechanical Engineering **Total Periods- 60**

Name of the Faculty: Mr. Nitesh Kumar Jha **No of periods /week- 4**

Week	Class day	Theory / Practical topic
1st	1st	Material and its classifications, ferrous and and its alloys,
	2nd	Physical properties of engineering materials, Chemical properties of engineering materials
	3rd	Mechanical properties of engineering materials- continue
	4th	Mechanical properties of engineering materials, Performance requirements
2nd	5th	Material reliability and safety. Doubt clear and revisions.
	6th	Ferrous Materials and alloys, Characteristics and application of ferrous materials
	7th	Classification, composition and application of low carbon steel. Classification, composition and application of medium carbon steel- continue
	8th	Classification, composition and application of medium carbon steel. Alloy steel: Low alloy steel, high alloy steel.
3rd	9th	Tool steel and stainless steel. Tool steel: Effect of various alloying elements such as Cr, Mn, Ni, V, Mo…continue
	10th	Tool steel: Effect of various alloying elements such as Cr, Mn, Ni, V, Mo, Doubt clear.
	11th	Iron – Carbon system
	12th	Concept of phase diagram
4th	13th	Cooling curves.
	14th	Iron -Carbon phase diagram.
	15th	Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel…continue
	16th	Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel
5th	17th	Doubt clear and revision
	18th	Class test
	19th	Crystal imperfections, Crystal defines, classification of crystals, ideal crystal
	20th	Crystal imperfections and its Classification, Point defects, line defects, surface defects and volume defects
6th	21st	Causes of point defects, Types of point defects: Vacancies
	22nd	Types of point defects: Interstitials
	23rd	Types of point defects: impurities
	24th	Types and causes of line defects
7th	25th	Edge dislocation and Screw dislocation
	26th	Effect of imperfection on material properties
	27th	Deformation by slip and twinning
	28th	Effect of deformation on material properties
8th	29th	Heat treatment, Purpose of heat treatment
	30th	Process of heat treatment: Annealing
	31st	Process of heat treatment: Normalizing
	32nd	Process of heat treatment: Hardening

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9th	33rd	Process of heat treatment: Tempering
	34th	Process of heat treatment: Stress relieving
	35th	Surface hardening: Carburizing
	36th	Surface hardening: Nitriding
10th	37th	Effect of heat treatment on properties of steel
	38th	Hardenability of steel
	39th	Doubt clear and revision
	40th	Non-ferrous alloys, Aluminum alloys…continue
11th	41st	Aluminum alloys: Composition, property and usages
	42nd	Composition, property and usages of Duralmin, Y- alloy
	43rd	Copper alloys: Composition, property and usage of Copper-Aluminum alloys
	44th	Copper alloys: Composition, property and usage of, Copper-Tin alloys
12th	45th	Copper alloys: Composition, property and usage of Babbit , Phosperous bronze, brass and Copper- Nickel alloy
	46th	Predominating elements of lead alloys, Zinc alloys
	47th	Predominating elements of Nickel alloys, low alloy materials…continue
	48th	Low alloy materials like P-91, P-22 for power plants and other high temperature services.
13th	49th	High alloy materials like stainless steel grades of duplex, super duplex materials etc.
	50th	Class test
	51st	Bearing Material, Classification, composition, properties and uses of Copper base bearing materials, Classification, composition, properties and uses of Tin Base bearing materials
	52nd	Classification, composition, properties and uses of Lead base materials, Classification, composition, properties and uses of Cadmium base bearing materials
14th	53rd	Spring materials, Classification, composition, properties and uses of Iron base spring material, Classification, composition, properties and uses of Copper base spring material
	54th	Polymers, Properties and application of thermosetting and thermoplastic polymers…continue
	55th	Elastomers and its properties
	56th	Composites and Ceramics, Classification, composition and properties of composites
15th	57th	Uses of particulate based and fiber reinforced composites Classification and uses of ceramics
	58th	Fiber reinforced composites and its Classification, composition, properties.
	59th	Doubt clear and revision
	60th	Class test

Sign of Faculty

Sign of HOD