LESSON PLAN

Discipline: Mech. Engg.	**Semester:** Third (3rd)	**Name of the Faculty:** Er Sandip Ku. Behera and Er Kishor Ku .Prusty
Subject: Engineering Material	**No. of days/week class allotted:** Five (5)	**Semester from Date:** 15.09.22 **to Date:** 22.12.22 **No. of Weeks:** 15
WEEK	**CLASS DAY**	**THEORY TOPICS**
1st	1st	Material classification into ferrous and non-ferrous category and alloys
	2nd	Properties of Materials: Physical, Chemical and Mechanical
	3rd	Performance requirements
	4th	Material reliability
	5th	safety
2nd	1st	**Review class**
	2nd	Characteristics of ferrous materials
	3rd	Application of ferrous materials
	4th	Classification, composition and application of low carbon steel, medium carbon steel and High carbon steel
	5th	Alloy steel: Low alloy steel, high alloy steel,
3rd	1st	tool steel and stainless steel
	2nd	Tool steel: Effect of various alloying elements such as Cr, Mn
	3rd	Tool steel: Effect of various alloying elements such as, Ni, V, Mo
	4th	**Review class**
	5th	Concept of phase diagram

4th	1st	cooling curves
	2nd	**Monthly Test 01**
	3rd	Features of Iron-Carbon diagram
	4th	salient micro-constituents of Iron and Steel
	5th	**Review class**
5th	1st	Crystal defines, classification of crystals, ideal crystal and crystal imperfections
	2nd	Classification of imperfection: Point defects, line defects, surface defects and volume defects
	3rd	Types and causes of point defects: Vacancies, Interstitials and impurities
	4th	Types and causes of line defects: Edge dislocation and screw dislocation
	5th	Effect of imperfection on material properties
6th	1st	Deformation by slip and twinning
	2nd	Effect of deformation on material properties
	3rd	Continue
	4th	**Review class**
	5th	Purpose of Heat treatment
7th	1st	Process of heat treatment: Annealing, normalizing, hardening, tampering, stress relieving measures
	2nd	Surface hardening: Carburizing and Nitriding
	3rd	Effect of heat treatment on properties of steel
	4th	**Monthly Test 02**
	5th	Hardenability of steel
8th	1st	**Review class**

	2nd	Aluminum alloys: Composition, property and usage of Duralmin,
	3rd	Aluminum alloys: Composition, property and usage of y-alloy.
	4th	Continue
	5th	Copper alloys: Composition, property and usage of CopperAluminum, Copper-Tin
9th	1st	Copper alloys: Composition, property and usage of, Babbit , Phosperous bronze, brass, Copper- Nickel
	2nd	Predominating elements of lead alloys, Zinc alloys
	3rd	Predominating elements of Nickel alloys
	4th	Low alloy materials like P-91, P-22 for power plants and other 10 high temperature services.
	5th	High alloy materials like stainless steel grades of duplex, super duplex materials etc.
10th	1st	**Review class**
	2nd	**Monthly Test 03**
	3rd	Classification, composition, properties and uses of copper base, Tin Base,
	4th	Classification, composition, properties and uses of, Lead base
	5th	Classification, composition, properties and uses of Cadmium base bearing materials
11th	1st	**Review class**
	2nd	Classification, composition, properties and uses of Ironbase spring material
	3rd	Classification, composition, properties and uses of Copper base spring material
	4th	Continue
	5th	Review
12th	1st	Properties of thermosetting and thermoplastic polymers
	2nd	Application of thermosetting and thermoplastic polymers
	3rd	Continue

	4th	Properties of elastomers
	5th	Continue
13th	1st	**Review class**
	2nd	Classification, composition, properties and uses of particulate based reinforced composites
	3rd	Classification, composition, properties and uses of fiber reinforced composites
	4th	Classification and uses of ceramics
	5th	Uses of ceramics
14th	1st	**Review class**
	2nd	**Monthly Test 04**
	3rd	Revision class
	4th	Revision class
	5th	Revision class
15th	1st	Revision class
	2nd	Revision class
	3rd	Revision class
	4th	Revision class
	5th	Revision class