DHABALESWAR INSTITUTE OF POLYTECHNIC
Academic Lesson Plan for Winter semester- 2022

Department: Mechanical Engineering
No. of periods per week: 4
End semester exam: 80
Total Marks: 100

Subject: Engineering Material
Total Periods: 60
Class test: 20

Sl. No.	Week	Period	Topic to be covered
1.	1st	1st	Material classification
2.		2nd	into ferrous and nonferrous category
3.		3rd	Alloys
4.		4th	Types of alloys
5.	2nd	1st	Properties of metal
6.		2nd	Physical , Chemical and Mechanical
7.		3rd	Performance requirements
8.		4th	Material reliability and safety
9.	3rd	1st	Characteristics of ferrous materials
10.		2nd	application of ferrous materials
11.		3rd	Classification of low carbon steel
12.		4th	composition of low carbon steel
13.	4th	1st	application of low carbon steel
14.		2nd	Classification of Medium carbon steel
15.		3rd	composition of Medium carbon steel
16.		4th	application of Medium carbon steel
17.	5th	1st	Classification of High carbon
18.		2nd	composition of High carbon steel
19.		3rd	application of High carbon steel
20.		4th	Alloy steel
21.	6th	1st	Low alloy steel

22.		2nd	high alloy steel
23.		3rd	tool steel
24.		4th	stainless steel
25.	7th	1st	Tool steel
26.		2nd	Effect of various alloying elements such as Cr, Mn, Ni, V, Mo
27.		3rd	cooling curves
28.		4th	Concept of phase diagram
29.	8th	1st	Crystal defines
30.		2nd	Features of Iron-Carbon diagram
31.		3rd	with salient micro-constituents of Iron and Steel
32.		4th	classification of crystals
33.	9th	1st	crystal imperfections
34.		2nd	Classification of imperfection
35.		3rd	Point defects
36.		4th	line defects
37.	10th	1st	volume defects
38.		2nd	surface defects
39.		3rd	Types and causes of point defects
40.		4th	Vacancies
41.	11th	1st	Interstitials and impurities
42.		2nd	Types and causes of line defects
43.		3rd	Edge dislocation
44.		4th	and screw dislocation
45.	12th	1st	Effect of imperfection on material properties
46.		2nd	Deformation by slip and twinning
47.		3rd	Deformation by slip and twinning
48.		4th	Effect of deformation on material properties
49.	13th	1st	Purpose of Heat treatment

50.		2nd	Process of heat treatment: Annealing, normalizing, hardening,
51.		3rd	tampering
52.		4th	, stress relieving measures
53.	14th	1st	Surface hardening: Carburizing and Nitriding
54.		2nd	and Effect of heat treatment on properties of steel
55.		3rd	Hardenability of steel
56.		4th	Aluminum alloys: Composition, property and usage of Duralmin, y-alloy.
57.	15th	1st	Copper alloys: Composition, property and usage of Copper-
58.		2nd	Aluminum, Copper-Tin, Babbit , Phosperous bronze, brass, Copper-Nickel
59.		3rd	Predominating elements of lead alloys, Zinc alloys and Nickel alloys
60.		4th	Low alloy materials like P-91, P-22 for power plants and other high temperature
			services. High alloy materials like stainless steel grades of duplex, super duplex materials etc.