UTKAL GOURAV MADHUSUDAN INSTITUTE OF TECHNOLOGY, RAYAGADA
Academic Lesson Plan for Winter Semester- 2022

Name of the Teaching Faculty: Er. Amiya Ranjan Patra **DEPARTMENT: Mechanical Engineering**
Semester: 3rd **Subject: ENGINEERING MATERIAL**
No. of Periods per Week: 4 **Total Periods: 60**
End Semester Exam: 80 **Class Test: 20**
Total Marks: 100 **Theory - 3**

Sl. No.	Week	Period	Topic to be covered
1.	1st	1st	Material classification
2.		2nd	Do
3.		3rd	Properties of Materials
4.		4th	Performance requirements
5.	2nd	1st	Material reliability and safety
6.		2nd	Characteristics and application of ferrous materials
7.		3rd	Classification, composition and application of low
8.		4th	carbon steel, medium carbon steel and High carbon steel
9.	3rd	1st	Alloy steel: Low alloy steel, high alloy steel, tool steel etc.
10.		2nd	Tool steel: Effect of various alloying elements likrCr, Mn etc.
11.		3rd	Concept of phase diagram and cooling curves
12.		4th	Do
13.	4th	1st	Do
14.		2nd	Features of Iron-Carbon diagram
15.		3rd	with salient micro-constituents of Iron and Steel
16.		4th	Do
17.	5th	1st	Do
18.		2nd	Do
19.		3rd	Crystal defines, classification of crystals, ideal crystal and
20.		4th	crystal imperfections
21.	6th	1st	Classification of imperfection: Point defects, line defects,
22.		2nd	surface defects and volume defects
23.		3rd	Types and causes of point defects: Vacancies,
24.		4th	Interstitials and impurities
25.	7th	1st	Types and causes of line defects
26.		2nd	Effect of imperfection on material properties
27.		3rd	Deformation by slip and twinning
28.		4th	Effect of deformation on material properties
29.	8th	1st	Purpose of Heat treatment
30.		2nd	Do
31.		3rd	Process of heat treatment: Annealing, normalizing,
32.		4th	hardening, tampering, stress relieving measures
33.	9th	1st	Do
34.		2nd	Surface hardening: Carburizing and Nitriding

35.		3rd	Effect of heat treatment on properties of steel
36.		4th	Do
37.	10th	1st	Hardenability of steel
38.		2nd	Do
39.		3rd	Aluminum alloys: Composition, property .
40.		4th	Usage of Duralmin, y- alloy.
41.	11th	1st	Copper alloys: Composition, property and usage of Copper Al.
42.		2nd	Copper-Tin, Babbit , Phosperous bronze, brass,Copper- Nickel
43.		3rd	Predominating elements of lead alloys,
44.		4th	Zinc alloys and Nickel alloys ,Low alloy materials
45.	12th	1st	P-91,P-22 for power plants and other high temperature services.
46.		2nd	High alloy materials like stainless steel grades of duplex,
47.		3rd	super duplex materials etc.
48.		4th	Do
49.	13th	1st	Classification, composition, properties and uses of Copper
50.		2nd	base, Tin Base, Lead base, Cadmium base bearing materials
51.		3rd	Do
52.		4th	Classification, composition, properties and uses of
53.	14th	1st	Iron base and Copper base spring material
54.		2nd	Do
55.		3rd	Properties and application of thermosetting
56.		4th	and thermoplastic polymers
57.	15th	1st	Properties of elastomers
58.		2nd	Classification, composition, properties & uses of particulate based composites.
59.		3rd	Fiber reinforced composites
60.		4th	Classification and uses of ceramics

The above lesson plan prepared by the concerned faculty.

Er. Amiya Ranjan Patra

PTGF, MECHANICAL DEPARTMENT