

Semester: 3rd
 No. of periods per week: 4
 End semester exam: 80
 Total Marks: 100

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

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

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

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