

LESSON PLAN

DEPARTMENT OF MECHANICAL ENGINEERING, ITT, CHOUDWAR

SUBJECT: Engineering Material

Periods: 4 per week

SEMESTER: 3TH

NAME OF FACULTY: TRIPATHY DEBASIS, LECTURER(MECH)

No. of weeks: 15

Week	Class Day	Theory / Practical Topics
1 st	1 st	Engineering materials and their properties Material classification into ferrous and non ferrous category and alloys Properties of Materials: Physical , Chemical and Mechanical
	2 nd	Performance requirements Material reliability and safety
2 nd	1 st	Ferrous Materials and alloys Characteristics and application of ferrous materials Classification, composition and application of low
	2 nd	Alloy steel: Low alloy steel, high alloy steel, tool steel and stainless steel
	3 rd	Tool steel: Effect of various alloying elements such as Cr, Mn, Ni, V, Mo,
	4 th	Revision
3 rd	1 st	Iron – Carbon system Concept of phase diagram and cooling curves Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel
	2 nd	Crystal imperfections Crystal defines, classification of crystals, ideal crystal and crystal imperfections
	3 rd	Classification of imperfection: Point defects, line defects, surface defects and volume defects
	4 th	Types and causes of point defects: Vacancies, Interstitials and impurities
4 th	1 st	Types and causes of line defects: Edge dislocation and screw dislocation
	2 nd	Effect of imperfection on material properties
	3 rd	Deformation by slip and twin twinning
	4 th	Effect of deformation on material properties
5 th	1 st	Heat Treatment Purpose of Heat treatment
	2 nd	Process of heat treatment: Annealing, normalizing, hardening, tempering, stress relieving measures
	3 rd	Surface hardening: Carburizing and Nitriding
	4 th	Hardenability of steel
6 th	1 st	Systems Concept of an ecosystem
	2 nd	Structure and function of an ecosystem.
	3 rd	Producers, consumers, decomposers.
	4 th	Energy flow in the ecosystems.

7 th	1 st	Ecological succession.
	2 nd	Food chains, food web and ecological pyramids.
	3 rd	Introduction, types, characteristic features, structure and function of the following ecosystem:
	4 th	Forest ecosystem: Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).
8 th	1 st	Biodiversity and its Conservation
	2 nd	Introduction-Definition: genetics, species and ecosystem diversity.
	3 rd	Biogeographically classification of India.
	4 th	Value of biodiversity: consumptive use, productive use, social ethical, aesthetic and opt in values.
9 th	1 st	Biodiversity at global, national and local level.
	2 nd	Value of biodiversity: consumptive use, productive use, social ethical, aesthetic and opt in values.
	3 rd	Biodiversity at global, national and local level.
	4 th	Threats to biodiversity: Habitats loss, poaching of wild life, man wildlife conflicts.
10 th	1 st	Non-ferrous alloys Aluminum alloys: Composition, property and usage of Duralmin, γ - alloy.
	2 nd	Copper alloys: Composition, property and usage of Copper- Aluminum, Copper-Tin, Babbit, Phosperous bronze, brass, Copper- Nickel
	3 rd	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.
	4 th	Bearing Material Classification, composition, properties and uses of Copper base, Tin Base, Lead base, Cadmium base bearing materials
11 th	1 st	Spring materials Classification, composition, properties and uses of Iron- base and Copper base spring material
	2 nd	Polymers
	3 rd	Properties and application of thermosetting and thermoplastic polymers
	4 th	Properties of elastomers
12 th	1 st	Composites and Ceramics
	2 nd	Classification and uses of ceramic
	3 rd	Revision
	4 th	Revision
13 th	1 st	Revision
	2 nd	Revision
	3 rd	Revision
	4 th	Revision
14 th	1 st	Revision
	2 nd	Revision
	3 rd	Revision
	4 th	Revision
15 th	1 st	Revision
	2 nd	Revision
	3 rd	Revision
	4 th	Revision