

TH3

GOVT. POLYTECHNIC, DHENKANAL

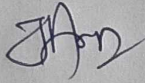
LESSON PLAN: ENGG.MATERIAL, 3RD – SEMESTER,(2024-2025)

Discipline: Mechanical Engineering	Semester: 3RD	Name of the teaching faculty: PRADEEP KUMAR JENA
Subject: EM	No of days/per week class allotted: 04	Semester From Date: 16/08/2024 To Date: 16/12/2024 No of weeks: 15
Week:	Class day:	Theory/practical topics:
1ST	1ST	CH-1 (Engineering materials and their properties) Classificatio of ferrous material
	2ND	Classificatio of non ferrous material and alloys
	3RD	Properties of material : Physical and chemical
	4TH	Properties of material : Mechanical
2ND	1ST	Performance requirements, material reliability, safety.
	2ND	CH-2(Ferrous material and alloys) Characteristics and application of ferrous materials.
	3RD	Classification, composition and application of low carbon steel, medium carbon steel and high carbon steel.
	4TH	Low alloy steel and high alloy steel.
3RD	1ST	Tool steel and stainless steel.
	2ND	Effect of various alloying elements such as Cr,Mn,Ni,V,Mo .
	3RD	Ch-3(Iron carbon system) Concept of phase diagram
	4TH	Concept of cooling curve
4TH	1ST	Relation between phase diagram and cooling curve .
	2ND	Drawing of Iron – carbon system with various point.
	3RD	Features of Iron – carbon system

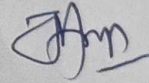
	4 TH	Features of Iron – carbon system
5 TH	1 ST	Micro constituents of Iron.
	2 ND	Micro constituents of steel.
	3 RD	CH-4(Crystal imperfections) Definition and classification of crystals .
	4 TH	Ideal crystal and crystal imperfection
6 TH	1 ST	Classification of imperfection
	2 ND	. Types and causes of point defects
	3 RD	Types and causes of point defects
	4 TH	Types and causes of line defects
7 TH	1 ST	Types and causes of line defects
	2 ND	Effect of imperfection on material properties
	3 RD	Deformation by slip and twinning.
	4 TH	. Effect of deformation on material properties.
8 TH	1 ST	CH-5(Heat treatment) Purpose of heat treatment
	2 ND	Process of heat treatment: Annealing
	3 RD	Normalizing
	4 TH	Hardening
9 TH	1 ST	Tampering
	2 ND	Stress relieving
	3 RD	Surface hardening : carburizing

	4 TH	Nitriding
10 TH	1 ST	Effect of heat treatment on properties of steel .
	2 ND	Hardenability of steel .
	3 RD	CH-6(Non-ferrous alloys) Aluminium alloys: Composition, property and usage of Duralmin
	4 TH	Composition, property and usage of γ -alloy
11 TH	1 ST	Copper alloy: Composition, property and usage of Copper-aluminium, copper-Tin
	2 ND	Composition, property and usage of Babbit and phosphorous bronze
	3 RD	Composition, property and usage of Brass and Copper-Nickel
	4 TH	Predominating elements of lead alloys, Zinc alloys and Nickel alloys
12 TH	1 ST	Low alloy material like p-91, p-22 for power plants and other high temperature services .
	2 ND	High alloy materials like stainless steel grades of duplex materials.
	3 RD	Super duplex materials .
	4 TH	Doubt clearing class
13 TH	1 ST	CH-7(Bearing Material) Classification , Composition, property and uses of Copper base, Tin base bearing material
	2 ND	Classification , Composition, property and uses of lead base bearing material
	3 RD	Classification , Composition, property and uses of cadmium base bearing material
	4 TH	CH-8(Spring Materials) Introduction to Spring material
14 TH	1 ST	Classification , Composition, property and uses of Iron base spring material
	2 ND	Classification , Composition, property and uses of copper base spring material.
	3 RD	CH-9(Polymers) Properties and application of thermosetting polymer.

	4 TH	Properties and application of thermoplastic polymers.
15 TH	1 ST	Properties of elastomer .
	2 ND	CH-(Composites and Ceramics) Classification , Composition, property and uses of particulate based composites .
	3 RD	Classification , Composition, property and uses of reinforced composites .
	4 TH	Classification and uses of ceramics .



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