NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)

LESSON PLAN

SUBJECT: ENGINEERING MATERIALS(TH-3)

Name Of The Faculty :- Er. Ramakanta Sethi
Branch :- Automobile Engineering **Semester :-** 3rd
Session :- 2025-26 **Examination :-** 2025 (W)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
1	Engineering materials and their properties,Ferrous Materials and alloys.	10	15
2	Iron – Carbon diagram,Crystal imperfections.	12	15
3	Heat Treatment.	7	5
4	Non -ferrous alloys,Bearing and spring Materials.	9	13
5	Polymers,Composites and Ceramics.	7	12
	Total Period	45	60

10/7/2025

Sign of Faculty

Sign of H.O.D.

Name of the programme: Diploma in AUTOMOBILE ENGINEERING	Semester: 3rd	**Name of the Teaching Faculty:** Er. Ramakanta Sethi	
		Academic Year : 2025-26 **Examination :** 2025 (W)	
Course Code: TH-3 (AEPC205)	**Course Year:** Second Year	**No. of Classes Alloted Per Week :**	4
		Planned Classes Required to Complete the Course	60

Week	Class Day	Topics to be Covered
1st	1st	**UNIT NO-I,Introduction:**ENGG. MATERIALS.
	2nd	Material classification.
	3rd	Ferrous and non-ferrous category and alloys.
	4th	Properties of Materials.
2nd	1st	Properties of Materials: Physical, Chemical and Mechanical,
	2nd	Performance requirements
	3rd	Material reliability and safety.
	4th	Ferrous Materials and alloys: Characteristics.
3rd	1st	Application of ferrous materials, Classification.
	2nd	Composition and application of low carbon steel,
	3rd	Medium carbon steel and High carbon steel.
	4th	Alloy steel: Low alloy steel.
4th	1st	High alloy steel, tool steel and stainless steel
	2nd	Tool steel: Effect of various alloying elements such as Cr, Mn.
	3rd	Tool steel: Effect of various alloying elements such as Ni, V, Mo.
	4th	**UNIT NO-II,Iron – Carbon diagram:** Concept of phase diagram
5th	1st	Cooling curves of iron carbon diagram.
	2nd	Features of Iron-Carbon diagram.
	3rd	Salient micro-constituents of Iron and Steel.
	4th	Crystal imperfections: Crystal defines.

Week	Class Day	Topics to be Covered
6th	1st	Classification of crystals, ideal crystal and crystal imperfections.
	2nd	Classification of imperfection: Point defects, line defects.
	3rd	surface defects and volume defects.
	4th	Types and causes of point defects: Vacancies, Interstitials and impurities.
7th	1st	Types and causes of point defects: Vacancies, Interstitials and impurities.
	2nd	Types and causes of line defects.
	3rd	Edge dislocation & Screw dislocation.
	4th	Effect of imperfection on material properties.
8th	1st	Deformation by slip and twinning.
	2nd	Effect of deformation on material properties.
	3rd	**UNIT NO-III,Heat Treatment:** Purpose of Heat treatment.
	4th	Process of heat treatment.
9th	1st	Annealing, normalizing,Hardening, tampering.
	2nd	stress relieving measures.Surface hardening: Carburizing.
	3rd	Nitriding, Effect of heat treatment on properties of steel,Hardenability of steel.
	4th	**UNIT NO-IV, Non -ferrous alloys:** Aluminum alloys.
10th	1st	Composition, property an usage of Duralmin.
	2nd	y-alloy. Copper alloys: Composition, property.
	3rd	Usage of Copper Aluminum.
	4th	Copper-Tin, Babbit, Phosperous bronze.
11th	1st	Brass, Copper- Nickel. Low alloy materials like P-91.
	2nd	P-22 for power plants and other high temperature services.
	3rd	High alloy materials like stainless steel grades of duplex.
	4th	Super duplex materials & revision.
12th	1st	**Bearing and spring Materials**: Classification.
	2nd	Composition, properties of bearing materials.
	3rd	Uses of Copper base, Tin Base, Lead base,Cadmium base bearing materials.
	4th	Classification, composition, properties and uses of Iron base,Copper base spring material.

Week	Class Day	Topics to be Covered
13th	1st	**UNIT NO -V,Polymers**:Properties.
	2nd	Application of thermosetting and thermoplastic.
	3rd	Polymers, Properties of elastomers.
	4th	Composites and Ceramics: Classification, composition properties.
14th	1st	Composites and Ceramics: Classification.
	2nd	Composites and Ceramics: composition properties.
	3rd	composition properties.
	4th	Uses of particulate based and fiber reinforced composites,
15th	1st	Classification and uses of ceramics.
	2nd	REVISION
	3rd	REVISION
	4th	REVISION

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