NILASAI OF SCIENCE & TECHNOLOGY

SERGARH-756060, BALASORE (ODISHA)

(Approved by AICTE& affiliated to SCTE&VT, Odisha)

LESSON PLAN

SUBJECT: TH-3(ENGINEERING MATERIAL)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl no	Name of the chapter as per the Syllabus	No of Periods as per syllabus	No of periods actually needed
1	Engineering materials and their properties	5	5
2	Ferrous Materials and alloy	5	6
3	Iron–Carbon system	8	9
4	Crystal imperfections	10	10
5	Heat Treatment	10	12
6	Non-ferrous alloys	10	10
7	Bearing Material	3	4
8	Spring materials	3	3
9	Polymers	3	4
10	Composites and Ceramics	3	5
	TOTAL PERIOD	60	68

Discipline: AUTOMOBILE ENGINEERING	Semester: 3rd	**Name of the Teaching Faculty:-** Er. Jyotirmay Biswas	
		SESSION:2023-24	**EXAMINATION**:2023(W)
Week	**Class Day**	**Topics to be covered**	
1st	**1st**	**Introduction to Engineering Material.**	
	2nd	Engineering materials and their properties	
	3rd	1.2 Properties of Materials:Physical,Chemical and Mechanical	
	4th	1.3 Performance requirements	
2nd	**1st**	1.4 Material reliability and safety	
	2nd	**2.0 Ferrous Materials and alloys** 2.1 Characteristics and application of ferrous materials	
	3rd	2.0 Ferrous Materials and alloys 2.1 Characteristics and application of ferrous materials	
	4th	2.2 Classification,composition and application of low carbon steel,medium carbon steel and High carbon steel	
3rd	**1st**	2.3 Alloy steel:Low alloy steel,high alloy steel,tool steel and stainless steel	
	2nd	2.4 Toolsteel: Effect of various alloying elements such as Cr,Mn,Ni,V,Mo,	
	3rd	2.4 Toolsteel: Effect of various alloying elements such as Cr,Mn,Ni,V,Mo,	
	4th	**3.0 Iron–Carbon system** 3.1 Concept o phase diagram and cooling curves	
4th	**1st**	3.0 Iron–Carbon system 3.1 Concept o phase diagram and cooling curves	
	2nd	3.1 Concept of phase diagram and cooling curves	
	3rd	3.1 Concept of phase diagram and cooling curves	
	4th	3.2 Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel	
5th	**1st**	3.2 Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel	
	2nd	3.2 Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel	
	3rd	3.2 Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel	
	4th	3.2 Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel	
6th	**1st**	**4.0 Crystal imperfections** 4.1 Crystal defines,classification of crystals,ideal crystal and crystal imperfections	
	2nd	4.1 Crystal defines,classification of crystals,idea lcrystal and crystal imperfections	
	3rd	4.1 Crystal defines,classification of crystals,idea lcrystal and crystal imperfections	
	4th	4.2 Classification of imperfection:Point defects,line defects,surface defects and volume defects	

Week	Class Day	Topics to be covered
7th	1st	4.2 Classification of imperfection:Point defects,line defects,surface defects and volume defects
	2nd	4.3 Types and causes of point defects:Vacancies,Interstitials and impurities
	3rd	4.4 Types and causes of line defects:Edge dislocation and screw dislocation
	4th	4.5 Effect of imperfection on material properties
8th	1st	4.6 Deformation by slip and twinning
	2nd	4.7 Effect of deformation on material properties
	3rd	**5.0 HeatTreatment**
	4th	5.1 Purpose of Heat treatment
9th	1st	5.2 Process of heat treatment: Annealing, normalizing, hardening, tampering, stress relieving measures
	2nd	5.2 Process of heat treatment: Annealing, normalizing, hardening, tampering, stress relieving measures
	3rd	5.3 Surface hardening:Carburizing and Nitriding
	4th	5.3 Surface hardening:Carburizing and Nitriding
10th	1st	5.4 Effect of heat treatment on properties of steel
	2nd	5.4 Effect of heat treatment on properties of steel
	3rd	5.4 Effect of heat treatment on properties of steel
	4th	5.5 Hardenability of steel
11th	1st	5.5 Hardenability of steel
	2nd	5.5 Hardenability of steel
	3rd	**INTERNAL ASSESSMENT**
	4th	**INTERNAL ASSESSMENT**
12th	1st	**6.0 Non-ferrous alloys** 6.1 Aluminum alloys:Composition,property and usage of Duralmin,y-alloy.
	2nd	6.1 Aluminum alloys:Composition,property and usage of Duralmin,y-alloy.
	3rd	6.1 Aluminum alloys:Composition,property and usage of Duralmin,y- alloy.
	4th	6.2 Copper alloys:Composition,property and usage of Copper-Aluminum,Copper-Tin, Babbit , Phosperous bronze, brass, Copper- Nickel
13th	1st	6.2 Copper alloys:Composition,property and usage of Copper-Aluminum,Copper-Tin, Babbit , Phosperous bronze, brass, Copper- Nickel
	2nd	6.2 Copper alloys:Composition,property and usage of Copper-Aluminum,Copper-Tin, Babbit , Phosperous bronze, brass, Copper- Nickel
	3rd	6.2 Copper alloys:Composition,property and usage of Copper-Aluminum,Copper-Tin, Babbit , Phosperous bronze, brass, Copper- Nickel
	4th	6.2 Copper alloys:Composition,property and usage of Copper-Aluminum,Copper-Tin, Babbit , Phosperous bronze, brass, Copper- Nickel
14th	1st	6.3 Predominating elements of lead alloys,Zinc alloys and Nickel alloys

Week	Class Day	Topics to be covered
14th	2nd	6.4 Low alloy materials like P-91,P-22 for power plants and otherhightemperature services. High alloy materials like stainless
	3rd	**7. Bearing Material** Classification,composition,properties and uses of Copper base,Tin Base,Lead base, Cadmium base bearing materials
	4th	7. Bearing Material Classification,composition,properties and uses of Copper base,Tin Base,Lead base, Cadmium base bearing materials
15th	1st	7. Bearing Material Classification,composition,properties and uses of Copper base,Tin Base,Lead base, Cadmium base bearing materials
	2nd	7. Bearing Material Classification,composition,properties and uses of Copper base,Tin Base,Lead base, Cadmium base bearing materials
	3rd	**8.0 Spring materials** 8.1 Classification,composition,properties and uses of Iron-base and Copper base spring material
	4th	8.1 Classification,composition,properties and uses of Iron-base and Copper base spring material
16th	1st	8.1 Classification,composition,properties and uses of Iron-base and Copper base spring material
	2nd	**9.0 Polymers** 9.1 Properties and application of thermo setting and thermoplastic polymers
	3rd	9.1 Properties and application of thermosetting and thermoplastic polymers
	4th	9.1 Properties and application of thermosetting and thermoplastic polymers
17th	1st	9.2 Propertiesof elastomers
	2nd	**10.0 Composites andCeramics** 10.1 Classification,composition,properties and uses of particulate based and fiber reinforced composites
	3rd	10.1 Classification,composition,properties and uses of particulate based and fiber reinforced composites
	4th	10.1 Classification,composition,properties and uses of particulate based and fiber reinforced composites
18th	1st	10.1 Classification,composition,properties and uses of particulate based and fiber reinforced composites
	2nd	10.2 Classification and uses of ceramics
	3rd	Revision
	4th	Revision