



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



LESSON PLAN

SUBJECT: TH-3 (ENGINEERING MATERIAL)

CHAPTERWISE DISTRIBUTION OF PERIODS

SLNO	NAME OF THE CHAPTER AS PER SYLLABUS	NO OF SYLLABUS AS PER SYLLABUS	NO OF PERIODS ACTUALLY NEEDED
1	Engineering materials and their properties	5	5
2	Ferrous Materials and alloy	5	5
3	Iron–Carbon system	8	8
4	Crystal imperfections	10	10
5	Heat Treatment	10	10
6	Non-ferrous alloys	10	10
7	Bearing Material	3	3
8	Spring materials	3	3
9	Polymers	3	3
10	Composites and Ceramics	3	3
	TOTAL PERIOD	60	60

Discipline: MECHANICAL ENGINEERING	Semester: 3rd	Name of the Teaching Faculty: Er. SANTOSH KUMAR	
Week	Class Day	Theory/Practical Topics	
1 st	1 st	Introduction to Engineering Material.	
	2 nd	Engineering materials and their properties Material classification into ferrous and non-ferrous category and alloys	
	3 rd	1.2 Properties of Materials: Physical, Chemical and Mechanical	
	4 th	1.2 Properties of Materials: Physical, Chemical and Mechanical	
	5 th	1.3 Performance requirements	
2 nd	1 st	1.4 Material reliability and safety	
	2 nd	2.0 Ferrous Materials and alloys 2.1 Characteristics and application of ferrous materials	
	3 rd	2.2 Classification, composition and application of low carbon steel, medium carbon Steel and High carbon steel	
	4 th	2.2 Classification, composition and application of low carbon steel, medium carbon Steel and High carbon steel	
	5 th	2.3 Alloy steel : Low alloy steel, high alloy steel, tool steel and stainless steel	
3 rd	1 st	2.4 Tool steel: Effect of various alloying elements such as Cr, Mn, Ni, V, Mo,	
	2 nd	CLASSTEST	
	3 rd	3.0 Iron-Carbon system 3.1 Concept of phase diagram and cooling curves	
	4 th	3.1 Concept of phase diagram and cooling curves	
	5 th	3.1 Concept of phase diagram and cooling curves	
4 th	1 st	3.2 Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel	
	2 nd	3.2 Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel	
	3 rd	3.2 Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel	
	4 th	3.2 Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel	
	5 th	3.2 Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel	
5 th	1 st	MIDSEM EXAM	
	2 nd	MIDSEM EXAM	
	3 rd	4.0 Crystal imperfections 4.1 Crystal defines, classification of crystals, ideal crystal and crystal imperfections	
	4 th	4.0 Crystal imperfections Crystal defines, classification of crystals, ideal crystal and crystal imperfections	4.1
	5 th	4.1 Crystal defines, classification of crystals, ideal crystal and crystal imperfections	

6 th	1 st	4.1Crystaldefines,classificationofcrystals,idealcrystalandcrystal imperfections
	2 nd	4.2Classificationofimperfection:Pointdefects,linedefects,surfacedefectsand volumedefects
	3 rd	4.2Classificationofimperfection: Pointdefects,linedefects,surface defectsand volume defects
	4 th	4.3Typesandcausesofpointdefects:Vacancies,Interstitialsandimpurities
	5 th	4.4Typesandcausesoflinedefects:Edgedislocationandscrewdislocation
7 th	1 st	4.5Effect ofimperfectiononmaterialproperties
	2 nd	4.6Deformationbyslipandtwinning
	3 rd	4.7 Effect ofdeformationonmaterial properties
	4 th	CLASSTEST
	5 th	5.0HeatTreatment 5.1PurposeofHeat treatment
8 th	1 st	5.1PurposeofHeat treatment
	2 nd	5.2Processofheattreatment:Annealing,normalizing,hardening,tampering,stress relieving measures
	3 rd	5.2Processofheattreatment:Annealing,normalizing,hardening,tampering,stress relievingmeasures
	4 th	5.3Surfacehardening:CarburizingandNitriding
	5 th	5.3Surfacehardening:CarburizingandNitriding
9 th	1 st	5.4Effect ofheattreatment onpropertiesof steel
	2 nd	5.4Effect ofheattreatment onpropertiesof steel
	3 rd	5.5Hardenabilityof steel
	4 th	5.5Hardenabilityof steel
	5 th	CLASSTEST
10 th	1 st	6.0Non-ferrousalloys 6.1Aluminumalloys:Composition,propertyandusageofDuralmin,y-alloy.
	2 nd	6.0Non-ferrousalloys 6.1Aluminumalloys:Composition,propertyandusageof Duralmin,
	3 rd	6.0Non-ferrousalloys 6.1Aluminumalloys:Composition,propertyandusageof Duralmin,
	4 th	6.1Aluminumalloys:Composition,propertyandusageofDuralmin,y- alloy.
	5 th	6.2Copperalloys:Composition,propertyandusageofCopper-Aluminum,Copper-Tin, Babbit , Phosperous bronze, brass, Copper- Nickel
11 th	1 st	6.2Copperalloys:Composition,propertyandusageofCopper-Aluminum,Copper-Tin, Babbit , Phosperous bronze, brass, Copper- Nickel
	2 nd	6.2Copperalloys:Composition,propertyandusageofCopper-Aluminum,Copper-Tin, Babbit , Phosperous bronze, brass, Copper- Nickel
	3 rd	6.3Predominatingelementsofleadalloys,ZincalloysandNickel alloys
	4 th	6.3Predominatingelementsofleadalloys,ZincalloysandNickel alloys

11 th	5 th	6.4 Low alloy materials like P-91, P-22 for power plants and other high temperature services. High alloy materials like stainless
12 th	1 st	6.4 Low alloy materials like P-91, P-22 for power plants and other high temperature services. High alloy materials like stainless
	2 nd	6.4 Low alloy materials like P-91, P-22 for power plants and other high temperature services. High alloy materials like stainless
	3 rd	CLASSTEST
	4 th	7. Bearing Material Classification, composition, properties and uses of Copper base, Tin base, Lead base, Cadmium base bearing materials
	5 th	Classification, composition, properties and uses of Copper base, Tin base, Lead base, Cadmium base bearing materials
13 th	1 st	Classification, composition, properties and uses of Copper base, Tin base, Lead base, Cadmium base bearing materials
	2 nd	8.0 Spring materials 8.1 Classification, composition, properties and uses of Iron-base and Copper base spring material
	3 rd	8.1 Classification, composition, properties and uses of Iron-base and Copper base spring material
	4 th	8.1 Classification, composition, properties and uses of Iron-base and Copper base spring material
	5 th	CLASSTEST
14 th	1 st	9.0 Polymers 9.1 Properties and application of thermosetting and thermoplastic polymers
	2 nd	9.1 Properties and application of thermosetting and thermoplastic polymers
	3 rd	9.2 Properties of elastomers
	4 th	10.0 Composites and Ceramics 10.1 Classification, composition, properties and uses of particulate based and fiber reinforced composites
	5 th	10.1 Classification, composition, properties and uses of particulate based and fiber reinforced composites
15 th	1 st	10.2 Classification and uses of ceramics
	2 nd	CLASSTEST
	3 rd	Revision.