

# SYNERGY SCHOOL OF ENGINEERING , Dhenkanal

## LESSON PLAN

Discipline : Mechanical Engg	Semester: 3rd Sem Mech	Name of faculty: Mihir kumar swain	
Sub:EM	No of Days/ week class allotted :- 4	Total no of weeks:- 15 Session 2024-25 (W)	Start date 5/7/24 End date 16/12/24
No of Week	Class day	Topic to be taught (Theory)	
1 <sup>st</sup>	1 <sup>st</sup>	Material classification into ferrous and non ferrous category and alloys	
	2 <sup>nd</sup>	Properties of Materials: Physical , Chemical and Mechanical	
	3 <sup>rd</sup>	Properties of Materials: Mechanical	
	4 <sup>th</sup>	Performance requirements	
2 <sup>nd</sup>	1 <sup>st</sup>	Material reliability and safety	
	2 <sup>nd</sup>	Characteristics and application of ferrous materials	
	3 <sup>rd</sup>	Classification, composition and application of low carbon steel, medium carbon steel and High carbon steel	
	4 <sup>th</sup>	Alloy steel: Low alloy steel, high alloy steel, tool steel and stainless steel	
3 <sup>rd</sup>	1 <sup>st</sup>	Effect of various alloying elements such as Cr, Mn, Ni, V, Mo,	
	2 <sup>nd</sup>	Concept of phase diagram	
	3 <sup>rd</sup>	Concept of cooling curves	
	4 <sup>th</sup>	Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel	
4 <sup>th</sup>	1 <sup>st</sup>	Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel	
	2 <sup>nd</sup>	Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel	
	3 <sup>rd</sup>	Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel	
	4 <sup>th</sup>	Crystal defines, classification of crystals, ideal crystal and crystal imperfections	
5 <sup>th</sup>	1 <sup>st</sup>	Classification of imperfection: Point defects, Types and causes of point defects: Vacancies	
	2 <sup>nd</sup>	Interstitials and impurities	
	3 <sup>rd</sup>	line defects, Types and causes of line defects: Edge dislocation and screw dislocation	
	4 <sup>th</sup>	surface defects and volume defects	
6 <sup>th</sup>	1 <sup>st</sup>	Effect of imperfection on material properties	
	2 <sup>nd</sup>	Deformation by slip and twinning	
	3 <sup>rd</sup>	Effect of deformation on material properties	
	4 <sup>th</sup>	Purpose of Heat treatment	
7 <sup>th</sup>	1 <sup>st</sup>	Process of heat treatment: Annealing	
	2 <sup>nd</sup>	Process of heat treatment: Annealing	
	3 <sup>rd</sup>	normalizing, hardening,	
	4 <sup>th</sup>	tempering, stress relieving measures	





8 <sup>th</sup>	1 <sup>st</sup>	Surface hardening: Carburizing and Nitriding
	2 <sup>nd</sup>	Effect of heat treatment on properties of steel
	3 <sup>rd</sup>	Hardenability of steel
	4 <sup>th</sup>	MONTHLY TEST-1
9 <sup>th</sup>	1 <sup>st</sup>	Aluminum alloys: Composition, property and usage of Duralmin, $\gamma$ - alloy
	2 <sup>nd</sup>	Aluminum alloys: Composition, property and usage of Duralmin, $\gamma$ - alloy
	3 <sup>rd</sup>	Copper alloys: Composition, property and usage of CopperAluminum, Copper-Tin
	4 <sup>th</sup>	Copper alloys: Composition, property and usage of Babbit , Phosperous bronze, brass, Copper- Nickel
10 <sup>th</sup>	1 <sup>st</sup>	Predominating elements of lead alloys
	2 <sup>nd</sup>	Zinc alloys
	3 <sup>rd</sup>	Nickel alloys
	4 <sup>th</sup>	Low alloy materials like P-91, P-22 for power plants and other 10 high temperature services.
11 <sup>th</sup>	1 <sup>st</sup>	High alloy materials like stainless steel grades of duplex, super duplex materials etc.
	2 <sup>nd</sup>	Classification, composition, properties and uses of Copper base, Tin Base bearing materials
	3 <sup>rd</sup>	Classification, composition, properties and uses of Lead base, Cadmium base bearing materials
	4 <sup>th</sup>	Classification, composition, properties and uses of Iron base spring material
12 <sup>th</sup>	1 <sup>st</sup>	Classification, composition, properties and uses of Copper base spring material
	2 <sup>nd</sup>	Properties and application of thermosetting polymers.
	3 <sup>rd</sup>	Properties and application of thermoplastic polymers.
	4 <sup>th</sup>	Properties of elastomers
13 <sup>th</sup>	1 <sup>st</sup>	Classification, composition, properties and uses of particulate based and fiber reinforced composites.
	2 <sup>nd</sup>	Classification, composition, properties and uses of particulate based and fiber reinforced composites.
	3 <sup>rd</sup>	Classification and uses of ceramics
	4 <sup>th</sup>	MONTHLY TEST-2
14 <sup>th</sup>	1 <sup>st</sup>	previous year questions & answers discussion
	2 <sup>nd</sup>	previous year questions & answers discussion
	3 <sup>rd</sup>	previous year questions & answers discussion
	4 <sup>th</sup>	previous year questions & answers discussion
15 <sup>th</sup>	1 <sup>st</sup>	previous year questions & answers discussion
	2 <sup>nd</sup>	previous year questions & answers discussion
	3 <sup>rd</sup>	previous year questions & answers discussion
	4 <sup>th</sup>	previous year questions & answers discussion

Prepared by:  
 02/07/24

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 H.O.D

