

# KIIT POLYTECHNIC, BHUBANESWAR

## LESSON PLAN Session (2023-2024)

<b>Discipline :</b> Metallurgy	<b>Semester: 6<sup>th</sup> Sem/Summer-2024</b>	<b>Name of the Teaching Faculty:</b> Deepak Kumar Patra Asst. Professor <b>Email ID:</b> deepak_patrafmt@kp.kiit.ac.in
Subject: Mech. Metallurgy ( Th-2)	No. Of Days/Week - 4	<b>Start Date:</b> 16/01/2024 <b>End Date:</b>
<b>Week</b>	<b>Class Day</b>	<b>Theory Topics</b>
1st	1st	Introduction.
	2nd	Dislocation, types, its basic behavior & role in deformation.
	3rd	Dislocation in various crystals & Source of dislocation.
	4th	Types of Dislocation.
2nd	1st	Deformation by Slip & Twinning.
	2nd	<b>Discussion on possible questionnaire</b>
	3rd	Explain the elastic & plastic behavior of metals.
	4th	Explain yielding criteria.
3rd	1st	Derive critically resolved shear stress.
	2nd	“Do”
	3rd	Explain deformation of polycrystalline aggregates.
	4th	<b>Discussion on possible questionnaire</b>
4th	1st	Classify different metal working process.
	2nd	Explain hot working and cold working of metals and alloys.
	3rd	State the advantages and disadvantages of hot and cold working.
	4th	<b>Quiz Test - 1</b>
5th	1st	Explain the phenomena, Recovery
	2nd	Recrystallization.
	3rd	Grain growth.
	4th	<b>Discussion on possible questionnaire</b>
6th	1st	Explain principles of rolling.
	2nd	“Do”
	3rd	Compare between hot rolling and cold rolling.
	4th	Explain the types of roll pass-open pass and box pass.

7th	1st	State different types of rolling defects and their control.
	2nd	<b>Discussion on possible questionnaire</b>
	3rd	Explain types of forging process.
	4th	"Do"
8th	1st	Describe the properties of forged products.
	2nd	Explain the defects of forged products and their control.
	3rd	"Do"
	4th	<b>Discussion on possible questionnaire</b>
9th	1st	Explain the elementary principle of extrusion.
	2nd	Classify the defects in extruded product.
	3rd	Explain the manufacturing of seamless pipes.
	4th	"Do"
10th	1st	<b>Discussion on possible questionnaire</b>
	2nd	Explain the elementary principle of wire drawing.
	3rd	Classify the defects of wire drawing.
	4th	<b>Discussion on possible questionnaire</b>
11th	1st	Describe the elementary concept of deep drawing.
	2nd	Explain sheet metal forming - bending shearing and blanking.
	3rd	"Do"
	4th	<b>Discussion on possible questionnaire</b>
12th	1st	Explain strengthening mechanism.
	2nd	Describe the role of grain boundary in strengthening.
	3rd	Define Hall Petch equation.
	4th	Describe yield point phenomenon.
13th	1st	Describe yield point phenomenon.
	2nd	<b>Quiz Test - 2</b>
	3rd	Explain strain-aging.
	4th	Explain solid solution strengthening from fine particles.
14 <sup>th</sup>	1st	Explain solid solution strengthening from fine particles.
	2nd	<b>Discussion on possible questionnaire</b>
	3rd	Describe martensitic strengthening.
	4th	Explain strain hardening.
15th	1st	Describe Bauschinger's effect.
	2nd	Describe Bauschinger's effect.
	3rd	<b>Discussion on possible questionnaire</b>

	4th	<b>Discussion on possible questionnaire</b>
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Recommended Books:                      Mechanical Metallurgy by Dieter

Reference Books:                      Mechanical Metallurgy by Avner