

**GOVERNMENT POLYTECHNIC JAJPUR**

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<b>Discipline: Metallurgy</b>	<b>Semester: 6th</b>	<b>Name of the Teaching faculty: Ashok kumar mishra</b>	
<b>Subject: Mechanical metallurgy</b>	<b>No of Days/Week class alloted: 4</b>	<b>Semester 10.6.2022</b>	<b>from Date:10.03.2022 To Date: No of weeks: 15</b>
<b>Week</b>	<b>Class Day</b>	<b>Topics</b>	
1st	1 <sup>st</sup>	introduction	
	2 <sup>nd</sup>	Dislocation and its types	
	3 <sup>rd</sup>	Dislocation behaviour	
	4 <sup>th</sup>	Dislocation role in deformation	
2nd	1 <sup>st</sup>	Dislocation in various crystals	
	2 <sup>nd</sup>	Sources of dislocation	
	3 <sup>rd</sup>	Twinning and deformation	
	4 <sup>th</sup>	Slip and deformation	
3rd	1 <sup>st</sup>	Explain elastic behaviour of metals	
	2 <sup>nd</sup>	Explain plastic behaviour of metals	
	3 <sup>rd</sup>	Explain yielding criteria	
	4 <sup>th</sup>	Explain yielding criteria	
4th	1 <sup>st</sup>	Derive critically resolved shear stress	
	2 <sup>nd</sup>	Class test	
	3 <sup>rd</sup>	Explain deformation of polycrystalline aggregates	
	4 <sup>th</sup>	Explain deformation of polycrystalline aggregates	
5th	1 <sup>st</sup>	Discussion regarding strengthening mechanism	
	2 <sup>nd</sup>	The role of grain boundary in strengthening mechanism	
	3 <sup>rd</sup>	Define Hall-petch equation	
	4 <sup>th</sup>	Describe yield point phenomenon	
6th	1 <sup>st</sup>	Explain strain aging	
	2 <sup>nd</sup>	Explain solid solution strengthening from fine particles	
	3 <sup>rd</sup>	Describe fiber strengthening	
	4 <sup>th</sup>	Describe martensitic strengthening	
7th	1 <sup>st</sup>	Explain strain hardening	
	2 <sup>nd</sup>	Describe bauschingers effect	
	3 <sup>rd</sup>	Classify different metal working process	
	4 <sup>th</sup>	Classify different metal working process	
8th	1 <sup>st</sup>	Explain hot working of metals	
	2 <sup>nd</sup>	<b>Explain cold</b> working of metals	
	3 <sup>rd</sup>	Advantages of cold and hot working	

	4 <sup>th</sup>	Disadvantages of cold and hot working
9th	1 <sup>st</sup>	Explain annealing and its importance
	2 <sup>nd</sup>	Recovery
	3 <sup>rd</sup>	Recrystallization
	4 <sup>th</sup>	Grain growth
10th	1 <sup>st</sup>	How it is affect different properties
	2 <sup>nd</sup>	Explain principle of rolling
	3 <sup>rd</sup>	Forces involved in rolling
	4 <sup>th</sup>	Compare between hot rolling and cold rolling
11th	1 <sup>st</sup>	Explain type of roll open pass and box pass pass
	2 <sup>nd</sup>	State different types of rolling defects and their controls
	3 <sup>rd</sup>	Rolling defect
	4 <sup>th</sup>	Remedies of rolling defect
12th	1 <sup>st</sup>	Explain types forging process
	2 <sup>nd</sup>	Open die forging and closed die forging
	3 <sup>rd</sup>	Equipment used for forging and properties of forging product
	4 <sup>th</sup>	Defects in forging and remedies
13th	1 <sup>st</sup>	Explain the elementary principle of extrusion
	2 <sup>nd</sup>	Direct and indirect extrusion
	3 <sup>rd</sup>	Direct and indirect extrusion
	4 <sup>th</sup>	Defects in extruded product
14th	1 <sup>st</sup>	Manufacturing of seam less pipe
	2 <sup>nd</sup>	Elementary principle of wire drawing
	3 <sup>rd</sup>	Internal examination
	4 <sup>th</sup>	Wire drawing equipment snd defects
15th	1 <sup>st</sup>	Concept of deep drawing
	2 <sup>nd</sup>	Bending,Shearing and blanking
	3 <sup>rd</sup>	Class test
	4 <sup>th</sup>	Bending,Shearing and blanking