GOVT. POLYTECHNIC MAYURBHANJ LESSON PLAN

Discipline : Metallurgy ENGG.		Semester: 4th Sem		Name of the Teaching Faculty : Arabinda Nayak
Subject : PM		No. of Days / per week class allotted : 04		Semester From date : 14.02.2023 To Date : 23.05.2023
MONTH	Week	Day	Unit	Topics
FEBRUARY	3rd	2nd	UNIT-1	**Crystal Structure of metals :**
		5th		Define crystal and crystallography
	4th	2nd		Define space lattice and unit cell
		2nd		Compare different types of crystal lattices, bravis lattices and primitive lattices.
		5th		Define with sketch B.C.C., F.C.C & H.C.P.
		1st		Define Miller indices, planes and directions
	5th	2nd		Define isotropy and anisotropy in metallic materials
		2nd		Define imperfections in metallic materials
		5th		Differentiate between types of imperfections :
		1st		point defect, line defect, surface defect and volume defect (elementary idea)
MARCH	2nd			**DOLO PURNIMA**
	3rd	2nd	UNIT-2	**Solidification of pure metals & alloys :**
		2nd		Define alloys and solid solution
		5th		Define solidification and crystallization
		1st		Explain role of free energy thermodynamic potential in conversion of liquid to solid
	4th	2nd		Define super cooling, under cooling, degree of super cooling
		2nd		Explain mechanism of solidification/ crystallization, nucleation, critical size nucleus,
		5th		spontaneous nucleation, relation between ration of nucleation and grain growth.
		1st		Discuss shape of crystals and solidification of ingot.
		2nd	UINT-3	**Equilibrium Diagram :**

	5th	2nd		Define equilibrium diagram
		5th		Discuss the importance of equilibrium diagram
		1st		**RAMA NAVAMI**
	6th	2nd		Draw equilibrium diagram of binary alloys
APRIL	1st	2nd		State types of equilibrium diagram
		2nd		Explain isomorphous equilibrium diagram with examples
		5th		**GOOD FRIDAY**
	2nd	2nd		Explain eutectic type and eutectoid equilibrium diagram with example
		5th		Explain peritectic type and peritectoid equilibrium diagram with example
		2nd		**CLASS TEST-1**
		1st		Define phase rule, lever rule
	3rd	2nd		Apply phase rule, and lever rule in each equilibrium diagram.
		2nd		Draw iron carbon equilibrium diagram and describe different phases and micro constituent in iron carbon diagram
		5th		Discuss role of carbon with iron to differentiate steel and cast iron
		1st		Apply lever rule in iron and carbon diagram
	4th	2nd		**MOHABISUBA SANKRANTI**
		2nd		Differentiate between iron-carbon, iron-cementite, and iron-graphite diagram.
		5th	**UINT-4**	**Solid solution :**
		1st		Define solution, alloying
	5th	2nd		Explain different types of solid solution
		2nd		**INTERNAL-I**
		5th		**INTERNAL-I**
		1st		**EID-UL-FITAR**
MAY	1st	2nd		Differentiate between substitutional and interstitial solid solution, chemical compound, mechanical mixture and intermetallic compounds
		5th		Differentiate between ordered and disordered solid solution.
	2nd	2nd		**BUDDHA PURNIMA**
		2nd		Define Hume Rothery rule and describe the different factors governing the formation of solid solutions.
		5th	**UNIT-5**	**Cast iron :**
		1st		**CLASS TEST-2**
	3rd	2nd		Define cast iron, differentiate between steel and cast iron, alloy steel and alloy cast iron.
		2nd		Discuss different types of cast iron with their composition.Define graphitization and role of graphitization in cast iron.Draw structures of cast iron
		5th	**UNIT-6**	**Metallurgical Microscope :**
		1st		Differentiate between metallurgical microscope & biological microscope
		2nd		Describe different types of metallurgical microscope.State working principle of metallurgical microscope.

	4th	2nd		Define magnifying power & resolving power, spherical and chromatic aberration.Explain with sketch principle of electron microscope
		5th		**SABITRI AMABASYA**
		1st		Prepare a sample for study of microstructures e.g. sampling, cutting, grinding, rough polishing, intermediate polishing, fine polishing and etching.