Govt. Polytechnic, Sonepur Session: 2024-25			
Discipline: **Metallurgy Engineering**	Semester:5rd	Name of the TeachingFaculty: **Arpita Jena**	
Subject:-**Heat Treatment Technology(TH-03)**	No. of days/per week class allotted:**4**	Semester from Date: **01. 07. 2024** to Date: **8.11.2024** No. of weeks: 15	
Week	**Class Day**	**Module**	**Lecture Topics**
1	1	Chapter -1: Solid State Phase Transformation	Introduction to Diffusion State Fick's Law
	2		Formation of Austenite
	3		Mechanism of formation of Austenite
	4		Austenitic Grain Size
	5		Methods of determination of austenitic grain size.
	6		State the importance of grain size
	7		Methods of control austenitic grain size
	8		Decomposition of austenite and pearlitic transformation.
	9		Process of construction of T-T-T diagram
	10		Construction of CCT diagram.
	11		T-T-T diagram for hypoeutectoid ,eutectoid and hyper eutectoid steel.
	12		Explain bainitic transformation.
	13		Explain martensitic transformation.

	14		Revision
	15		Question Discussion
2	16	Chapter -2: Heat treatment process for steels.	Discuss Annealing.
	17		Explain Stress reliving annealing.
	18		Different type of annealing.
	19		Process of annealing.
	20		Process of normalizing.
	21		Process of hardening.
	22		.Factor affecting hardening process.
	23		Explain different methods of hardening.
	24		Discuss quenching media.
	25		Different types of quenchants.
	26		.Tempering process of steel.
	27		Themo-mechanical treatment of steel.
	28		Discuss martempering.
	29		Austempering and subzero treatment.
3	30		Define hardenability.
	31		Discuss the method of determination of hardenability.

	32	Chapter-3:Hardenability	Gross Man's critical diameter method and jominey end quench method.
	33		Method of estimation of hardenability from chemical composition
	34		Fracture test.
	35		Factors affecting hardenability
	36		Effect of austenitic grain size.
	37		Alloying Element.
		Chapter-4: Surface Hardening Methods	.-do-
4	38		Discuss high frequency induction hardening
	39		Flame hardening
	40		Electron beam hardening, laser hardening.
	41		Methods of case depth measurement of steel.
	42		Explain different carburising
	43		Post Carburizing heat treatment
	44		Titriding of steel
	45		Cyaniding,carbo-nitriding of steel.
	46		Plasma Nitriding.
	47		.Salt bath nitro carburizing.

	48		Boronising,chromizing, & Toyato diffusion process.
	49		Revision
	50	Chapter-5: Discuss the heat treatment of Non-ferrous Alloys.	Age hardening Process
	51		Age hardening of Al-Cu Alloys.
	52		Revision
6	53		Discuss of curde petroleum.
	54		Explain the production and uses of coal tar.
	55		-do-
	56		Tutorial Class
	57	Chapter-6: Alloy Steels and heat-tratment of Alloy Steels.	Define specific gravity,viscosity etc.
	58		Explain details Flash point,fire point and pour point etc.
	59		Explains details aniline point,octane number and cetane number.
	60		Discuss the methods of testing of following peopertiers.

Prepared By
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HOD 28/05/19
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