

## **METALLURGY DEPARTMENT**

Name of the teacher-PARASMITA BISWAL

Semester-5<sup>th</sup> -Session-2021-22

From-

Subject-Theory-3(Heat treatment technology)

Wk no	Class/Day	Theory topics :
Week -1	Day-1	Solid State Phase Transformation.
Week -2	Day-1	Give an introduction to diffusion, state fick"s law
	Day-2	Discuss the formation of austenite.
	Day-3	Explain the mechanism of formation" of austenite
	Day-4	Discuss austenitic grain size
Week -3	Day-1	Explain the methods of determination of austenitic grain size.
	Day-2	State the importance of grain size
	Day-3	Explain the method of measurement of grain size.
	Day-4	Discuss the methods of control austenitic grain size.
Week -4		PUJA VACATION
Week -5	Day-1	Discuss decomposition of austenite and pearlitic transformation
	Day-2	Explain the process of construction of T-T-T diagram and CCT diagram.
	Day-3	Discuss the TTT Diagram for hypo eutectoid, eutectoid and hyper eutectoid steel.
	Day-4	Explain bainitic transformation.
Week 5	Day-1	Explain martensitic transformation.
	Day-2	Discuss annealing.

	Day-3	Explain stress relieving annealing.
	Day-4	Explain different types of annealing-01
<b>Week -6</b>	Day-1	Explain different types of annealing-02
	Day-2	Discuss the process of hardening, normalising
	Day-3	Describe the factors affecting hardening process.
<b>Week -7</b>	Day-1	Explain different methods of hardening.
	Day-2	Discuss quenching media and different types of quenchants.
	Day-3	Explain the tempering process for steel.
	Day-4	Discuss thermo-mechanical treatment of steel.
<b>Week -8</b>	Day-1	Class test and revision class
	Day-2	Define hardenability
	Day-3	Hardenability , method of determination of hardenability Gross Man"s critical diameter method &Jominey end quench method.
<b>Week -9</b>	Day-1	Discuss the method of estimation of hardenability from chemical composition and fracture test.
	Day-2	Discuss the factors affecting hardenability: effect of austenitic grain size, carbon content, and alloying elements.
	Day-3	Discuss high frequency induction hardening -flame hardening,
	Day-4	Discuss the methods of case depth measurement of steel.
<b>Week -10</b>	Day-1	Explain different carburizing-processes of steel: pack carburizing, liquid carburizing,
	Day-2	Discuss the post carburizing heat treatment. gas carburizing and vacuum carburizing.
	Day-3	Explain process of nitriding of steel.
	Day-4	Explain the process of cyaniding, carbo-nitriding of steel.
<b>Week -11</b>	Day-1	Explain the plasma nitriding.salt bath nitro carburizing
	Day-2	Discussion on electron beam hardening, laser hardening.

	Day-3	Explain boronising, chromizing & Toyato diffusion process.
	Day-4	Discuss Age Hardening of Al-CU alloys.
<b>Week -12</b>	Day-1	Discuss different alloy steels- low alloy and high alloy steels.
	Day-2	Class test and revision class
	Day-3	Discussion on martempering, austempering
	Day-4	Discussion on subzero treatment
<b>Week -13</b>	Day-1	Discuss die steel, high speed steel, high strength steel
	Day-2	Discussion on low alloy steels, stainless steels.
	Day-3	Discuss the effect of alloying elements.
	Day-4	Discuss the heat treatment of tool steel and stainless steel.
<b>Week-14</b>	Day-1	Important question discussion
	Day-2	Important question discussion
	Day-3	Doubt clearing class
	Day-4	Class test covering entire syllabus