

GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA IN METTALLURGY ENGINEERING

SEMESTER: V

Subject Name: **Steel Making**

Sr. No.	Course Content
1.	Introduction to Steel Making: 1.1 Define steel and give classification / national/international. 1.2 Differentiate between cast iron/steel/wrought iron/pig iron. 1.3 Explain principle of steel making. 1.4 Explain difference between Acid and Basic steel making. 1.5 List steel making processes.
2.	Cementation and Crucible Process: 2.1 List the historical processes. 2.2 Explain crucible process. 2.3 Explain the principles of crucible and cementation. 2.4 Explain briefly the method of production. 2.5 Discuss the quality of steel produced by these processes. 2.6 Discuss the limitations of these processes.
3.	Pneumatic Processes: 3.1 List the pneumatic processes. 3.2 Explain the manufacture of steel by various pneumatic processes like: (i) Bessemmer processes (Acid and Basic) (ii) L.D. process (iii) Kaldo process. Discuss these processes with following details: (a) Principle (b) Raw material selection (c) Furnaces used (d) Chemical reactions (e) Steps involved / procedure (f) Products obtained (g) Quality of the product. (h) merits and limitations.
4.	Open Hearth Processes: 4.1 Discuss open hearth steel making process with following details: (a) Principle (b) Raw material selection (c) Furnaces used (d) Chemical reactions (e) Steps involved / procedure

	(f) Products obtained (g) Quality of the product. (h) Merits and limitations.
5.	Electrical (Steel Making) Processes: 5.1 Discuss electrical steel making process with following details (a) Principle (b) Raw material selection (c) Furnaces used (d) Chemical reactions (e) Steps involved / procedure (f) Products obtained (g) Quality of the product. (h) Merits and limitations.
6.	Casting of Ingots and Ingots Defects: 6.1 Explain conventional methods of teeming steel ingots. 6.2 Explain merits -limitations of them. 6.3 Explain structure of ingot and study causes of defects. 6.4 Explain continuous casting of steel. 6.5 Explain advantages of continuous casting.
7.	Environment Safety and Conservation of Energy in Steel Industry: 7.1 Explain importance of environment control. 7.2 Explain safety precautions observed. 7.3 Explain the steps taken for energy conservation in steel plant.

References Books:

1. Modern steel making by R.H. Tupkary.
2. Making, shaping and treating of steel by USSC.
3. Manufacture of iron and steel by G.R. Bashforth Vol. I/ II/ III/ IV.
4. Elements of metallurgy by D. Swarup.

Laboratory Experiments:

1. To study the classification of rolling mills based on products.
2. To study and draw rolling mills of different mill designs.
3. To draw and understand main drive of rolling mill and roll design.
4. Prepare path sequence for manufacture of Blooms, Billets, and Slabs.
5. To study path sequence for manufacture of tubes.
6. To study path sequence for manufacture of special shapes:(Wheels, Tyres, Rail products).
7. To study path sequence for manufacture of sections: I beam, Channels, Angles and squares.
8. To study path sequence for Heat treatment of rolled products.
9. To study and understand defects in rolled products.