

GUJARAT TECHNOLOGICAL UNIVERSITY
DIPLOMA IN METALLURGY ENGINEERING

Semester: 4

Subject Name: JOINING OF METALS

Sr. No.	Course content
1.	INTRODUCTION TO PRODUCTION METALLURGY 1.1 Occurrence of metals. 1.2 Definition of ore, mineral, gangue, flux, slag. 1.3 Availability of raw materials in India, its locations. 1.4 Iron and steel plants in India.
2.	PRINCIPLES OF IRON MAKING 2.1 Definition of pig iron, cast iron, steel, wrought iron and sponge iron. 2.2 Importance of the composition of the raw materials. 2.3 Brief principles of iron making.
3.	IRON MAKING BY BLAST FURNACE 3.1 Raw materials. 3.2 Preparation of the raw materials for iron making. 3.3 Properties of coke. 3.4 Construction of the blast furnace. 3.5 Blast furnace accessories, stoves and dust catchers. 3.6 Chemistry of the blast furnace. 3.7 Operation of the blast furnace. 3.8 Measures taken for control of the blast furnace irregularities. 3.9 Blast furnace refractories. 3.10 Modern trends in blast furnace. 3.11 Disposal of the iron and the slag.
4.	ALTERNATIVE METHODS OF IRON MAKING 4.1 Need for alternative methods. 4.2 Types of various alternative methods. 4.3 Brief principles of alternative methods. 4.4 Advantages and limitations of alternative methods. 4.5 Mini blast furnace for iron making.

5.	PRODUCTION OF SPONGE IRON BY NATURAL GAS 5.1 Definition, composition and application of S.I. 5.2 Flow chart for production of sponge Iron. 5.3 Principle of sponge Iron production. 5.4 Steps involved in detail in S.I. production. 5.5 Automations and mechanization in production plant for S.I.
6.	APPLICATION OF PIG IRON 6.1 Types/grades of P.I. 6.2 Uses of various grades of P.I.
7.	ENVIRONMENT, SAFETY AND CONSERVATION OF ENERGY IN IRON MAKING 7.1 Importance of Pollution control in Iron metals plant. 7.2 Safety rules in Iron metals plant. 7.3 Conservation of energy at various stages of Iron making.

Reference Books:

Sr. No.	Name of Books	Author
1.	Manufacture of iron and steel Vol. I, II	G.R.Bashforth
2.	Iron making	T.H.Tupkary
3.	Elements of metallurgy	D.Swarup
4.	Ferrous metallurgy	Dennis