

GUJARAT TECHNOLOGICAL UNIVERSITY

Diploma in Metallurgy Engineering

Semester: 3

Subject Code

Subject Name FUEL, FURNACES AND REFRACTORIES

Sr. No.	Course content
1.	INTRODUCTION OF FUEL : 1.1 Introduction and availability of fuel. 1.2 Classification of fuel with example (like solid, liquid, gas) 1.3 Merits and demerits of each fuel.
2.	COAL, COKE AND GASEOUS FUEL : 2.1 Origination and formation of coal. 2.2 Types of coal. 2.3 Carbonization of coal. 2.4 Methods for testing properties like calorific value, Flash point, Fire point. 2.5 Production, composition and uses of water gas and producer gas. 2.6 Definition and uses of blast furnace gas & coke oven gas.
3.	METALLURGICAL FURNACES : 3.1 Define furnaces. 3.2 Classify furnaces on the basis of uses, fuel. 3.3 Construction and working of production furnaces like Blast furnaces, reverberatory, open hearth, LD, Kaldo. 3.5 Construction and working of melting furnaces like Cupola, Rotary furnaces, Crucible furnaces, Electric furnaces. 3.6 Heat treatment furnaces, - Types with temperature controls, - Applications, - controlled atmospheres. 3.7 Atmospheric control in various furnaces.
4.	INTRODUCTIONS OF REFRACTORIES : Transparences, Seminar, Factory visit 4.1 Define refractory material. 4.2 Properties of refractory material. 4.3 Classification of refractory with example.
5.	MANUFACTURING AND TESTING OF REFRACTORIES : 5.1 Steps in production of refractories like selection of material, crushing, grinding, mixing, sintering. 5.2 Test on refractories like Pyrometric cone equivalent (PCE) test, RUL test, Spaling test.

Reference Books:

1. Fuels by Braime and King
2. Industrial furnaces by W. Trinks
3. Refractories by F.H.Norton
4. Refractories by D. Swarup
5. Introduction to Foundry Tech. by A.K.Winter by Ekay Winter