

PROGRAMME : DIPLOMA IN METALLURGICAL ENGINEERING
 Subject : BASIC METALLURGY
 Subject Code : MET304
 L T P
 3 0 0
 FULL MARKS : 100 (80 + 20)

RATIONALE :-

Basic Metallurgy mainly deals with basic topics required for the understanding of metallurgical subject. This course is a collection of widely different basic topic such as pyrometry, fuels, vacuum technology, refractories, conceptual understanding of structure of solid material, their properties and uses.

OBJECTIVES:-

The students will be able to

1. Visualize the structures of solids.
2. Distinguish between metals and non metals.
3. Make use of various equipments required to measure high temperature.
4. Appreciate the applications of refractory's, solid, liquid and gaseous fuels
5. Acquire the knowledge of various types of furnaces.

Contents:-

Sl.No.	Description	Hrs & Marks
01.	Introduction : Metals and Metallurgy its application in different fields of engineering, a brief history of Metallurgical practices in India, Ores and Minerals, Crystal structures of metals, imperfection in crystal-point, line and surface defects.	8 Hrs 16 marks
02.	Gases dissolved in metals, Sievert's Law, Effect of presence of gases in metals, importance of vacuum treatment of metals.	6 Hrs 12 marks
03.	Major classification of Metallurgy : Hydro, Pyro and Electro metallurgy of metals, A brief account of Roasting, Calcination and Smelting, Leaching an exchange, Heating effect of electricity.	6 Hrs 12 marks
04.	Refractory materials : Classification, properties and application of refractory materials, Silica, Alumina, Magnesite, Zirconia materials.	5 Hrs 8 marks

05.	Polymers and Polymerization methods, concept of composite materials, their types and importance.	5 Hrs 8 marks
06.	Fuels : Liquid, Solid and Gaseous fuels, Proximate and Ultimate analysis of Coal, Properties of Coke, Comparative study of Solid, Liquid and Gaseous.	6 Hrs 12 marks
07.	Furnaces : Types of furnaces, Used in Industries, Pyrometry, Principle of Thermometry, Thermo Couples : Composition, Preparation and Calibration. Optical and radiation Pyrometers.	6 Hrs 12 marks

Reference Books :

1. Physical Metallurgy O P Khanna
2. Physical Metallurgy Avner
3. Extractive Non Ferrous Metals H S Rai
4. Extractive Metallurgy Rosen Gwes
5. Elements of Metallurgy D Swaroop