

## **MSE-317 –Metals and Alloys-2 (3 CH)**

**Pre-requisites:** MSE-213 (Metals and Alloys-1)

### **Course Objectives**

1. The course is designed to study the unique properties and structure of metals and alloys. The basic goals are:
  - a. To introduce the rudimentary concepts about metals and alloys.
  - b. To introduce the manufacturing and processing methods of steels and nonferrous alloys.

### **Course Contents**

2. Description and properties of carbon steels: Plain carbon steels, Low-alloy steels and cast steels; Stainless steels: Martensitic stainless steels, ferritic stainless steels, austenitic stainless steels, Duplex stainless steels, Designation system of iron and steels (ASTM, AISI, DIN etc).

Non-ferrous metals and their ores, extraction and refining of non-ferrous metals, Aluminium, Copper, Zinc, Magnesium, Titanium, Nickel, Chromium, Silver, Gold, Tungsten and molybdenum, common non-ferrous alloys and their melting procedures, Designation systems of Al, Cu, Zn, Mg, Ti, Ni, Cr etc.

### **Course Outcome:**

3. The student should be able to understand;
  - a. Extraction and refining processes of common ferrous and nonferrous metals and alloys.
  - b. Designation systems and common properties of various ferrous and non-ferrous alloys.

### **Suggested Books:**

1. Donald R. Askeland, The Science and Engineering of Materials, 7<sup>th</sup> Edition, Global Engineering, (2015)
2. Francoise Cardarelli, Materials Handbook, 2<sup>nd</sup> Edition, Springer, (2008)