

## **MSE-202 Materials Engineering Lab II**

**Credit Hours:** 0-1

**Pre-requisites:** None

### **Course Objectives**

- To know about the effect of aging on rolled steel, effect of mechanical properties and microstructures and hardness of rerolled steel, Tensile testing, Deformation and Fracture of given specimen.

### **Course Contents**

- The effect of natural aging on the hardness of Al-2024
- The effect of artificial aging on the hardness of Al-2024
- The effect of annealing on the microstructure and hardness of re-rolled steel
- The effect of cooling rate on mechanical properties and microstructure of steel
- Preparation of tensile test specimen, according to ASTM A370-03, and to carry out tensile test
- Observation of the micro-structure of mild steel specimen prior to and after deformation
- Finding the melt flow index of given polymer at different temperatures
- Determination of the impact strength of given metallic sample
- The injection molding of HDPE
- Demonstration of Gel Permeation Chromatography
- The effect of deformation and fracture on hardness of given sample
- The effect of temperature on the viscosity of given polymer

### **Course Outcome**

- Students after attending this course will be able to study the effect of aging on rolled steel, effect of mechanical properties and microstructures and hardness of rerolled steel, Tensile testing, Deformation and Fracture of given specimen.

### **List of Practicals**

- To study the effect of natural aging on the hardness of Al-2024 alloy.
- To study the effect of artificial aging on the hardness of Al-2024 alloy.

- To study the effect of annealing on the microstructure and hardness of re-rolled plain carbon steel.
- To study the effect of cooling rate on mechanical properties and microstructure of plain carbon steel.
- To observe the micro-structures of mild steel specimen prior to and after deformation.
- How to find the melt flow index of given polymer at different temperatures.
- To carry out the injection molding of HDPE (high density polyethylene).
- Demonstration of Gel Permeation Chromatography.
- To study the effect of deformation and fracture on hardness of given sample.
- To carry out the viscosity measurement of different solutions using Ubbelohde viscometer.

### **Suggested Books**

- Consult the books related to the subjects covered in semester 4