

**IC (209)415**                      **Characteristics and Properties of Ceramics**                      **3(2/2-1/3)**

**Abbreviation**                      CHAR PROP CERAMIC

**Prerequisite**                      **IC 316**

**This course is opened for**    MAJOR ELECTIVE COURSE (PLAN I), MAJOR COMPULSORY COURSE (PLAN II)

### Course Description

Characterization of ceramic powder, particle mechanics, and properties of ceramic materials.

### Objectives

1. Students will be able to understand principles and characterization techniques of ceramic powder.
2. Students will be able to understand properties of ceramic materials.
3. Students will be experienced with laboratories involving characterization and properties of ceramic materials.

### Course Content

### Lecture Hours

1. Introduction	3
1.1 Ceramic materials	
1.2 Raw material specification	
1.3 Microstructure and properties	
2. Characterization of ceramic powder	9
2.1 Physical characterization	
2.2 Chemical composition	
2.3 Phase composition	
2.4 Surface characterization	
3. Particle mechanics	9
3.1 Types of colloids	
3.2 Particle-particle interaction	
3.3 Electrostatic stabilization	
3.4 Polymeric stabilization	
3.5 Rheology of colloidal suspension	
4. Properties of ceramic materials	9
4.1 Fundamentals of fracture mechanics	
4.2 Fracture strength and toughness	
4.3 Thermal stresses and fracture	
4.4 Wear	
4.5 Electrical properties	
4.6 Magnetic properties	

Total	30
-------	----

**Laboratory Topics**

1. Characterization of ceramic powder
2. Particle mechanics
3. Properties of ceramic materials

**Laboratory hours**

15

15

15

---

**Total**

---

45

---