

# **COURSE OUTLINE**

## **TECH 353**

### **Industrial Materials**

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**Text:** Budinski, Engineering Materials Properties and Selection  
Broska, Materials Testing and Experimental Methods

**Course Objectives:** To have students demonstrate a basic understanding of materials and materials testing.

#### **Course Outline:**

- I. Fundamentals of Measurement of Experimentation**
  - A. Introduction**
  - B. Dimensions, Units, Error, Uncertainty**
  - C. Experimental Planning**
  - D. Statistical Data Analysis**
  - E. Theory and Practice of Experimentation**
  - F. Curve Plotting**
  - G. Report Writing**
  - H. Measuring Systems**
    - (1) Introduction and Use**
  
- II. Introduction to Materials**
  - A. Properties and Uses**
  
- III. Fundamentals of Material Structure**
  - A. Submicroscopic**
  - B. Microscopic**
  - C. Macroscopic**
  - D. Behavior of Materials**
  
- IV. Introduction of Metals, Woods, Plastics, Ceramics, Composites**

- V. Material Testing Systems**
  - A. Introduction**
  - B. Failure in Materials**
  - C. Types of Tests**
    - 1. Destructive**
      - a. Tensile and Compression**
      - b. Hardness**
      - c. Bending**
      - d. Impact**
      - e. Fatigue**
      - f. Creep, Torsion, and Shear**
    - 2. Non-Destructive**
      - a. Visual**
      - b. Radiographic**
      - c. Ultrasonic**
      - d. Magnetic**
      - e. Electrical**
      - f. Other**

<b>Grading:</b>	<b>Tests (4)</b>	<b>42%</b>
	<b>Lab Submittals</b>	<b>35%</b>
	<b>Lab Participation</b>	<b>5%</b>
	<b>Final</b>	<b>15%</b>
	<b>Homework</b>	<b>3%</b>