

# **COURSE OUTLINE**

**ENSC 221**

**Mechanics of Materials**

**3 Credit Hours**

## **The Community College of Baltimore County**

### **Description**

#### **Mechanics of Materials**

Covers distortion of materials due to stress and temperature as well as internal strain and external displacement; examines application to beams, shafts, columns, and other structural, machine and vehicle members is emphasized.

Prerequisite: ENSC 111 or consent of instructor.

### **Overall Course Objectives**

Upon completion of this course, the student will be able to:

1. use the concepts of normal, shearing and bearing stress
2. understand stress under general loading conditions.
3. understand ultimate and allowable stress
4. understand stress-strain diagrams and applications.
5. understand deformations in a circular shaft.
6. understand pure bending in prismatic and symmetric members.
7. understand transverse loading of prismatic members.
8. understand transformation of plane stress.
9. understand the basic considerations for the design of prismatic beams.
10. understand deformations in beams and columns.

### **Major Topics**

- I. Concept of Stress
- II. Stress and Strain-Axial Loading
- III. Torsion
- IV. Pure Bending
- V. Transverse Loading
- VI. Transformation of Stress and Strain
- VII. Design of Beams and Shafts
- VIII. Deformation of Beams
- IX. Columns

### **Course Requirements**

Grading/Exams            Grading procedures will be determined by the individual faculty member but will be based on exams.