



Broward Community College

Course Outline

STATUS: A

COMMON COURSE NUMBER: ETG 2530

COURSE TITLE: Strength of Materials

CREDIT HOURS: 2

CONTACT HOURS BREAKDOWN:

Lecture/Discussion 32

Lab

Other

Contact Hours/Week 2

CATALOG COURSE DESCRIPTION:

Prerequisite: MTB 1321, MTB 1322, PHY 1001 or instructor approval

Co requisite: None

A study of static and strength of materials without the use of advanced mathematics. An introduction to solving problems using an electronic calculator. This course should be taken concurrently with ETG 2530L.

General Education Requirements - Associate of Arts Degree, meets Area(s):

General Education Requirements - Associate in Science Degree, meets Area(s):

UNIT TITLES:

1. Fundamental Concepts of Equilibrium
2. Analysis of Trusses
3. Centroids and Moment of Inertia
4. Shear and Moment Diagrams
5. Stresses, Strains and Deflections

I. Course Overview:

Upon successful completion of this course, the students should be able to describe and apply the fundamentals of statics and mechanics of materials according to accepted professional standards with a high degree of accuracy.

II. Units:

Unit 1. Fundamental Concepts of Equilibrium

General Outcome:

1.0 The students should be able to demonstrate a proficiency in the fundamental concepts of equilibrium.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 1.1 Describe the symbols and abbreviations used in structural design.
- 1.2 Describe the various types of loads on structures.
- 1.3 Describe the basic laws of statics.

Unit 2. Analysis of Trusses

General Outcome:

2.0 The students should be able to demonstrate a proficiency in the basic methods of determining the magnitude of forces acting in truss members.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 2.1 Identify various types of trusses.
- 2.2 Analyze truss forces by the joint method.
- 2.3 Analyze truss forces by the section method.

Unit 3. Centroids and Moment of Inertia

General Outcome:

3.0 The students should be able to demonstrate a proficiency in the basic concepts of calculating the geometric properties of sections, including centroids and moment of inertia.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 3.1 Identify and calculate the centers of pressure and radius of gyration of different sections.
- 3.2 Describe the derivation of basic formulae used to compute moments of inertia.
- 3.3 Calculate moments of inertia using the transfer theorem.

Unit 4. Shear and Moment Diagrams

General Outcome:

4.0 The students should be able to demonstrate a proficiency in the fundamental concepts and application of shear and moment diagrams in designing timber and steel structures.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 4.1 Draw shear diagrams for various loading conditions.
- 4.2 Draw moment diagrams for various loading conditions.
- 4.3 Interpret diagrams to determine the location and magnitude of maximum shear and moment.

Unit 5. Stresses, Strains and Deflections

General Outcome:

5.0 The students should be able to demonstrate a proficiency in stresses, strains and deflections.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 5.1 Identify and describe various types of stresses.
- 5.2 Identify and describe linear and angular strains.
- 5.3 Describe the derivation of basic deflection formulae.