



# Broward Community College

## Course Outline

---

---

STATUS:   A  

COMMON COURSE NUMBER:   ARC 2580  

COURSE TITLE:   Structures  

CREDIT HOURS:           3          

CONTACT HOURS BREAKDOWN:

Lecture/Discussion           64          

Lab           00          

Other           00          

Contact Hours/Week           4          

CATALOG COURSE DESCRIPTION:

Prerequisite:   MAC 1105

Corequisite:   None

Basic study in the principles and evaluations of structures as applied to architecture. Major topics of study include static, stress, and the characteristics of beam and column behavior. This course will enable the student to develop a structural sense in creating architectural solutions.

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

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

UNIT TITLES:

1. Forces
2. Trusses
3. Moment of Inertia and Stress Diagrams
4. Shear and Bending Stress
5. Beam Design
6. Columns

## **I. Course Overview:**

Upon successful completion of this course, the students should be able to apply basic concepts in building structural systems as they relate to function, layout, hierarchy, and simple analysis and design.

## **II. Units:**

### **Unit 1. Forces**

#### General Outcome:

- 1.0 The students should be able to understand forces in structures.

#### Specific Learning Outcomes:

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

- 1.1 Understand types and origins of force systems.
- 1.2 Analyze simple force diagrams and movement.

## Unit 2. Trusses

### General Outcome:

2.0 The students should be able to understand trusses in structural system.

### Specific Learning Outcomes:

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

2.1 Translate tensile and compressive axial stress.

2.2 Use of laws of equilibrium to analyze trusses.

### Unit 3. Moment of Inertia and Stress Diagrams

#### General Outcome:

3.0 The students should be able to understand centroid and moment of inertia formulas.

#### Specific Learning Outcomes:

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

3.1 Draw shear diagrams.

3.2 Draw moment diagrams.

## Unit 4. Shear and Bending Stress

### General Outcome:

4.0 The students should be able to understand the origins and translation of stress thru a transversely loaded structural component.

### Specific Learning Outcomes:

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

4.1 Develop and use flexure formula.

4.2 Develop and use shear formula.

## Unit 5. Beam Design

### General Outcome:

5.0 The students should be able to understand basic structural criteria effecting design of beams.

### Specific Learning Outcomes:

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

- 5.1 Select beam size and shape by shear and moment.
- 5.2 Select beam size and shape by deflection.

## Unit 6. Columns

### General Outcome:

6.0 The students should be able to understand basic structural criteria in column design.

### Specific Learning Outcomes:

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

6.1 Understand shape, slenderness, connections, and buckling.

6.2 Select column size and shape by Euler formula criteria.