Syllabus

ARC 248 Structural Design

General Information

Date
September 25th, 2018

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Department
Science and Technology

Course Prefix
ARC

Course Number
248

Course Title
Structural Design

Course Information

Credit Hours
4

Lecture Contact Hours
3

Lab Contact Hours
2

Other Contact Hours
0

Catalog Description
ARC 248 Structural Design is intended for Architectural Technology majors. Students will be introduced to the fundamental concepts related to structural design and analysis. Topics covered include 1) forces, 2) trusses, 3) shear & bending moment diagrams, 4) properties of sections, 5) estimating live & dead loads, 6) designing wood beams, columns, & connections, and 7) designing steel beams, columns, and connections. The material covered in this class is presented in a lecture format.

Key Assessment
This course does not contain a Key Assessment for any programs

Prerequisites
MET 216

Co-requisites
None

Grading Scheme
Letter

First Year Experience/Capstone Designation

This course DOES NOT satisfy the outcomes applicable for status as a FYE or Capstone.

SUNY General Education

This course is designated as satisfying a requirement in the following SUNY Gen Ed category
None

FLCC Values

Vitality   Inquiry   Perseverance   Interconnectedness

Course Learning Outcomes

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1. Employ algebraic and graphic methods for structural analysis.

2. Compare various structural options to best integrate with architectural intent.

3. Analyze structural components to identify and resolve forces and reactions.

4. Determine structural components from calculations, formulas, tables and graphs for design of appropriate and efficient structural systems.

Program Affiliation

This course is not required as a core course in a program

Outline of Topics Covered

Introduction

- Forces Acting on a Building

- Code Requirements

Working with Forces

- Adding Force Vectors

- Finding Resultant Forces

- Separating a Force into Horizontal & Vertical Components

Laws of Equilibrium

- $\Sigma H = 0$, $\Sigma V = 0$, $\Sigma M = 0$

Analyzing a Truss

Direct Stress & Deformation

- $f = P / A$ (Stress = Force / Area)

- Modulus of Elasticity

Analysis of Beams

- $\Sigma H = 0$, $\Sigma V = 0$, $\Sigma M = 0$

- Finding Reactions

- Shear Diagrams

- Moment Diagrams

- Properties of Sections

- Flexure Formula: $M = f S$

- Horizontal Shear: fv = VQ / Ib

Steel Design

- Beams

- Columns

- Connections

Wood Design

- Beams

- Columns

- Connections