

Engineering Technology – CET Option

Course Number and name: ET 432 Applied Design of Structures II

Credits and Contact Hours: 4 cr. 46 contact hours -- lecture
40 contact hours – laboratory

Instructor's name: Ruinian Jiang

Textbook:

1. George F. Limbrunner and ABI O. Aghayere, *Reinforced Concrete Design*, 6th Ed., Prentice Hall, 2007, ISBN: 0-13-118767-8.
2. Jack C. McCormac, *Structural Steel Design*, 4th Ed, Pearson, ISBN: 0-13-600111-4.

References: Manual of Steel Construction (ASD and LRFD), ACI 318, International Building Code, NDS for Wood Construction, AASHTO LRFD Bridge Design Specifications.

Specific Course Information:

Course Catalog Description: Continuation of ET 332. Design of beams, columns, beam-columns, slabs, footings, connections, frames. Analysis of structural components and systems and their response to various loadings. Preparation for the Civil Portion of the FE exam.

Course Prerequisites: ET 332 and ET 354

Goals/Objectives:

To introduce the student to basic methods of structural analysis and design of structural components. The primary objective is to expose students to intense code usage so that they will be able to apply various codes required by industry.

- an appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines
- an ability to design a system, component, or process to meet desired needs
- an ability to identify, formulate, and solve engineering problems
- an understanding of professional and ethical responsibility
- an ability to communicate effectively
- ability to build structures based on design.

This course will help achieve the following goals of the overall program outcomes (ABET outcomes):

design medium size structure main members	3a, b	9a
select optimum structural alternative	3b	9b
structural cost analysis	3b, c	9e
use basic structural analysis and design knowledge	3d, f	9f,g
communicate effectively by team oral presentation	3e	
communicate effectively by writing formal project report	3g	

Basic Topics:

- Structural beam design (steel, concrete, wood, masonry)
- Structural column design (steel, concrete, wood, masonry)
- Structural beam-column design (steel, concrete, wood, masonry)
- Frame design
- Composite beam
- Structural footing design
- Structural wall design
- Structural tension member design
- Structural panel
- Structural diaphragm

Computer Usage: Excel, RISA

Laboratory Projects: Design problems integrating lectures and codes as well scale model construction and testing.

Oral and Written Communication Requirements: Periodic laboratory reports on designs and scale model development

Calculus Usage: Used in the development of shear, moment, slope & deflection equations.

Library Usage: Most of the references listed for the class are available in the reference section of Branson library.

Prepared by Ruinian Jiang, December 2010