

COURSE SYLLABUS (2 Page)

Course Number: CEGR 3221
Course Name: Structural Steel Design I

Credits and Contact Hours: 3

Instructor: Matthew Whelan

Required Textbook: *Title:* Steel Construction Manual (14th ed.)
Authors: American Institute of Steel Construction (AISC)
Year: 2011

Recommended Textbook: *Title:* Structural Steel Design (5th ed.)
Authors: McCormac and Csernak
Year: 2012

Catalog Description: Analysis and design of structural steel components with emphasis on theories necessary for a thorough understanding of the design procedure. Design philosophies and types of steel structures. Columns, tension members and laterally supported beams are considered. General Flexural theory, including bending of unsymmetrical sections. Current AISC Specifications used.
Most Recently Offered (Day): Spring 2016, Fall 2015, Spring 2015
Most Recently Offered (Evening): Course has not been offered in 3 years

Pre-Requisites/Co-Requisites: CEGR 3122 and CEGR 3255 with grades of C or above

Course is: Selected Elective (SE); Must Choose Either CEGR 3225 or CEGR 3221

Goals: The objectives of this course are to instill in each student an understanding of the theory/logic behind the design equations used to select steel sections. The student should be able to perform the basic design of tension, compression and flexural members. The student should have a solid understanding of lateral torsional buckling and its potential for structural failures if overlooked in a design. They should have an appreciation of the importance of the presentation of their work and the ethical responsibilities of the structural engineer.

Student Outcomes Addressed:

In this course, students will develop the following Student Outcomes:

- A. an ability to apply knowledge of mathematics, science, and engineering
- C. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- E. an ability to identify, formulate, and solve engineering problems
- I. a recognition of the need for, and an ability to engage in life-long learning
- J. a knowledge of contemporary issues
- K. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Course Topics:

Introduction to steel design and the AISC LFRD Manual; Specifications and Building Codes, loads and methods of design (LRFD); The factor of safety utilized in the ASD and LRFD methods/equations; Limit states (serviceability and strength); Analysis and design of tension, compression and flexural members; Unsymmetrical bending and lateral torsional buckling are emphasized.