

CEE 4350 – ADVANCED STRUCTURAL DESIGN
Required Course

Catalog Description:

CEE 4350 (5350): Advanced Structural Design. Lecture 3. Credit 3. Special topics in analysis and design of steel structures. Plastic design, composite design, plate girders, special connections. Prerequisite: CEE 4310.

Math & Basic Sciences:	0 Credits	Course Coordinator:	E. P. Ryan
Engineering Topics:	3 Credits	Contains Significant Design:	No
General Education:	0 Credits	Updated:	06/01/14
Other:	0 Credits	Specify Type if Other:	

Text Book(s) and Supplemental Material(s):

Jack C. McCormac, *Structural Steel Design, LRF Method*, Fourth edition, 2007.

Course Goal(s):

The goal of CEE 4350 (5350) “Advanced Structural Design” is to extend the student’s knowledge on several advanced topics in analysis and design of steel structures.

Instructional Outcomes for the Course:

Students will be expected to:

1. Understand the fundamental design principles of slender-element compression members;
2. Determine the required design strength for beam-columns from a second-order elastic analysis procedure or an approximate second-order analysis procedure, and be able to design the beam-column;
3. Analyze and design of connections in combined loading cases including combined tension and bending, combined shear and torsion, and combined shear and bending, etc.;
4. Understand the behavior and design principles of plate girders and composite beams, and be capable of the design of these members; and
5. Understand some current commercial software and its application in structural design.

Criterion 3 Student Outcomes addressed by this Course:

- a) An ability to apply knowledge of mathematics, science, and engineering (Level 3)
- b) An ability to design and conduct experiments, as well as to analyze and interpret data (Level 4)
- e) An ability to identify, formulate, and solve engineering problems (Level 4)
- k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (Level 3)

Program Criteria addressed by this Course:

- 1. Apply knowledge of math and sciences (level 3)
- 2. Apply knowledge of four technical areas appropriate to civil engineering (level 4)
- 3. Design a system, component, or process in more than one civil engineering context (level 5)

Course Topics:

- 1. Design principles of slender-element compression members (3 classes)
- 2. Design principles of flexural-torsional buckling strength (2 classes)
- 3. Thorough treatment of combined bending and axially loaded member (8 classes)
- 4. In-depth treatment of simple building connections and special connections (14 classes)
- 5. Design of plate girders (6 classes)
- 6. Composite design for beams (6 classes)
- 7. Tests (3 classes)

Additional Topics/Assignments for dual-level (4000/5000) courses:

N/A