

CVET-230-01 Elementary Structures *Spring 2015*

Instructor: **Dr. Amanda Bao, P.E.**

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Lecture: **M, W, F, 11:00-11:50am, Room ENT (82) -3185**

Office Hours: **T: 11:00am-12:00pm; W: 3:00-4:00pm; R: 11:00am-12:00pm**

Text:

1. Aghayere, Abi O. and Limbrunner, George F., Reinforced Concrete Design, 8th Edition, Pearson, 2014
2. Class handouts for Structural Steel Design

References:

1. ACI 318-08: Building Code Requirements for Structural Concrete and Commentary, 2008
2. AISC Steel Construction Manual, 14th Edition, American Institute of Steel Construction
3. Aghayere, Abi, and Vigil, Jason, Structural Steel Design: A Practical Oriented Approach, Prentice Hall, 2008

Prerequisites:

Statics (CVET-210)

Strength of Materials (CVET-220)

Intended Learning Outcomes:

After completing this course, you will be able to:

1. Calculate dead, live, snow, acting on building structures and components using IBC and ASCE 7 Codes. Identify vertical load paths in building structures.
2. Analyze and design simple concrete members such as beams, T-beams, columns, slabs and footing using ACI 318 code.
3. Analyze and design simple structural steel members such as beams, columns and tension members using ASD (Allowable Stress Design) design methods.
4. Analyze and design structural steel connections (bolted connection and welded connection) using ASD design methods.
5. Present the design calculations in a professional manner.

Course Outline:

1. Introduction to gravity loads and load paths (5 lectures)
2. Introduction to reinforced concrete structures (1 lecture)
3. Rectangular concrete beams and one-way slab: bending strength (6)
4. Shear in concrete beams (4 lectures)
5. Introduction to concrete columns (4 lectures)
6. Introduction to concrete footings (4 lectures)
7. Introduction to structural steel structures (1 lecture)
8. Steel tension members (4 lectures)
9. Steel compression members (4 lectures)
10. Non-composite steel beams (5 lectures)
11. Bolted connections (3 lectures)
12. Welded connections (2 lectures)
13. Tests (3 lectures)

Homework Assignments:

Homework assignment will be given on a weekly basis and due one week later. Refer to the homework assignment file on the course website at <http://mycourses.rit.edu>.

- **Homework problems are due by 4pm on the assigned due date. No late homework will be accepted or graded.**
- Calculations should be neat and organized. Sketches, assumptions, units, and references must be included, where appropriate. Show all works in details. Use Engineering paper only, write on one side and box your solutions. All numerical values shall include the appropriate units. Points will be deducted from the assignment grade if this format is not followed.
- No point will be given for work that has been copied from other students or resources.
- Assignments will be graded and handed back within one week.
- Solutions to the homework assignments will be posted in the display case outside CETEMS office.

Homework Assignments Schedule:

Homework #	Handout Date	Due date	Topic
1	Fri. 1/30/15	Fri. 2/6/15	Dead load & live load
2	Fri. 2/6/15	Fri. 2/13/15	Live load & snow load
3	Fri. 2/13/15	Fri. 2/20/15	Concrete beam bending
4	Fri. 2/20/15	Mon. 3/2/15	Concrete beam & slab
5	Mon. 3/2/15	Mon. 3/9/15	Concrete beam shear
6	Mon. 3/9/15	Wed. 3/18/15	Concrete column
7	Wed. 3/18/15	Mon. 3/30/15	Concrete footing
8	Mon. 3/30/15	Wed. 4/15/15	Steel tension member
9	Wed. 4/15/15	Mon. 4/27/15	Steel compression member
10	Mon. 4/27/15	Wed. 5/6/15	Steel beam
11	Wed. 5/6/15	Wed. 5/13/15	Steel connections

Conduct in Lectures:

Please be on time and conduct yourself in a respectful and professional manner in class. Students will refrain from wearing headphones, earpieces, or other audio devices during class. Laptops can only be used during class for note-taking purposes. Cell phones, pagers, texting devices, I-pods, etc. must be turned off and stored prior to entering the classroom.

Course Web Site, Online Discussions, and E-mail:

The course web site at <http://mycourses.rit.edu> will mainly be used to post handouts, homework and test information. Some announcements relating to this course may be sent to you via e-mail.

Exams:

There will be **three** 50-minute tests and a final exam in this course, and all exams are open book and notes.

Exams Schedule: (Exams are open book and open notes)

Exam #	Date	Covers HW #
1	Fri. 2/27/15	1, 2, 3
2	Fri. 4/3/15	4, 5, 6
3	Wed, 4/22/15	7, 8
4	Final Exam	All

Note: No make-up tests will be given except in **very extenuating** circumstances and only if the instructor is given prior notice. **The final exam will not be returned** but you may look through your graded final exam booklet in my office.

Grade Distribution:

Attendance	= 5%
Homework	= 20%
Three 50-Minute Tests@ 15% each	= 45%
2-hour Final Exam	= 30%

Letter Grades:

The letter grades in this course will be assigned as follows:

A	=	93-100
A-	=	90-92
B+	=	87-89
B	=	83-86
B-	=	80-82
C+	=	77-79
C	=	73-76
C-	=	70-72
D	=	60-69
F	=	Below 60