

Department of Civil and Environmental Engineering
West Virginia University

CE 462 - Reinforced Concrete Design

Class hours: 05:00 - 6:15 PM T TH, Spring 2015, Room 207 ESB

Instructor: Dr. Hung-Liang (Roger) Chen, Professor
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Office hours: 1:00 - 2:00PM MWF, or by appointment.

Course Objectives:

To design and analyze reinforced concrete members.

Course Description:

Understanding the material properties; design methods; safety considerations; ACI code; beams under flexure and shear; columns under flexure and axial loads; bond and anchorage. Introduction to slabs, floor system, footing, and prestressed concrete.

Text book:

"Reinforced Concrete - A Fundamental Approach" by E. G. Nawy, 6th edition (**ACI 318-08 code edition**), Prentice Hall, 2009, ISBN-10: 0-13-241703-0.

Course Outline:

1. Introduction (Chap.1 and 2)
2. Material Properties of Concrete and Reinforcement (Chap.3 and 4)
3. Flexure in Beams (Chap.5)
4. Shear and Diagonal Tension in Beams (Chap.6)
5. Combined Compression and Bending: Columns (Chap.9)
6. Bond Development of Reinforcing Bars (Chap.10)
7. Serviceability of Beams and One-way Slabs (Chap.8)
8. Introduction to Footings (Chap.12) and Concrete Structural Floor Systems
9. Introduction to Prestressed Concrete (Chap.14)
10. Introduction to Seismic Design of Concrete Structures (Chap.16)
11. Experimental Observation of Reinforced Concrete Behavior
12. Introduction to Computer-Aided Design programs

References:

- (1) Building Code Requirements for Reinforced Concrete and Commentary, ACI 318-14, American Concrete Institute, 2014.
- (2) Design of Concrete Structures by Nilson, Dawin and Dolan, 14th ed., McGraw Hill, 2010.
- (3) Design of Reinforced Concrete by McCormac and Brown, 9th ed., Wiley, 2013.
- (4) Reinforced Concrete Design by Wang, Salman and Pincheira, 7th ed., Wiley, 2007.

Grading:

Homework:	15
Class Participation and 4 Quizzes:	15
Midterm Exam:	30
Final Exam:	35
Design Project:	15

	110

	Grade
Above 90	A
89 - 80	B
79 - 70	C
69 - 60	D
59 - 0	F

Remark:

- (1) Midterm Exam and Final Exam will be in-class. There will be NO MAKE-UP EXAM.
- (2) Reading the textbook and the class notes, and class participation are required. When you are not able to come to class, please let me know. Taking notes in class is strongly recommended. Think with me and try to understand everything in class. If you have questions, feel free to ask me immediately.
- (3) Homework assignment will have a due date. NO LATE HOMEWORK will be accepted unless there is an emergency.
- (4) Five quizzes will be given in class and the lowest score will not be counted. Quiz dates will be announced and there will be NO MAKE-UP QUIZ.
- (5) The design project will be a team project. Each team should have 3-4 members. Choose your own team partners. Choose your own topics (feel free to discuss this with me). Use your computer skill and creativity. The final report should be a design project report. Grading will be based on the final report, the presentation and the use of teamwork.

Each team has to submit the followings:

1. Names of your members and your team - 1/22/2015.
 2. Tentative titles of your project and work-share (responsibility) of each member – 2/10/2015.
 3. Project Title and Table of Contents - 2/19/2015.
 4. Final report - 4/16/2015.
- Presentation of the project (15 min./team) - 4/21/15, 4/23/15

Final Exam: Wednesday May 6, 2015, 08:00AM-10:00AM (please check registrar.wvu.edu website).