

Instructor	Dr. Mahmoud Reda Taha, P. Eng Professor, Chair & Regents' Lecturer Centennial Engineering Center: CENT 3006 Tel: (505) 277-1258, e-mail: mrtaha@unm.edu
Lectures	Twice Weekly: Tuesday and Thursday 9:30 – 10:45 Centennial Engineering Center CENT 1026
Textbooks	- <i>Textbook: Reinforced Concrete: Mechanics and Design, 7th Edition, James Wight, Prentice Hall, 2015</i> - ACI Building Code for Structural Concrete (ACI 318-08) - Lecture notes delivered in the class.
Lecture Notes	- Lecture notes will be available on UNM Learn - Lecture notes are designed to complement the textbook. Students are supposed to read both the lecture notes and the parts of the textbook that cover the subjects discussed by the instructor.
Office Hours	Monday & Thursday 1:00 – 3:00 pm or by appointment. You can always communicate with me by email.
Learning Objectives	<u>After completing this course the student shall be able to</u> 1- Explain principles of reinforced concrete mechanics 2- Compute load and materials factors. 3- Explain the main characteristics of concrete as a structural material 4- Design of concrete elements under flexural loads including a- Determining the required amount of reinforcement b- Check shear strength of concrete elements c - Check serviceability limits of concrete beams and slabs d- Check anchorage length requirements and steel curtailment 5- Design of concrete columns and combined axial and bending loads. 6- Design of two way slabs with and without beams
Expected Outcomes (In accordance with Civil Engineering Departmental Goals)	<ul style="list-style-type: none"> • This course contributes to the following educational outcomes in the objectives of the CE Department: • A familiarity with the modern tools for engineering analysis, including computers and sophisticated laboratory equipment. • An ability to approach and solve engineering problems in a structured manner. • Synthesis of knowledge from various sources to produce creative, cost-effective designs for civil engineering facilities. • A commitment to become licensed professional engineers. • An ability to communicate effectively, both in written and oral forms, as well as an ability to listen. • A sensitivity to practice personal and professional ethics. • Understanding societal and environmental issues.

- Assignments** - A list of all assignments and their due dates are listed below
The following rules apply to all assignments:
 - All assignments represent 20% of the total course grade.
 - Assignments shall be delivered by the due date or will be marked of a maximum of 50%.
 - Assignments delayed for one week from due date will be rejected.

Course Project A reinforced concrete design project is expected from all students. The project will include conducting structural analysis and design of a concrete structure. Work will include performing the basic design calculations and developing basic design drawings. Groups of up to 4 students will be formed by the instructor. Each group will present their project at the end of the semester. Further details will be provided by the instructor.

Expected performance Students are expected to be familiar with computer programs for structural analysis (e.g. SAP 2000 and/or ANSYS). Students shall also get familiar with engineering-programming environments such as MATLAB, MathCad and Excel. Examples in these programs will be used. It is the duty of the student to get familiar with these programs. Feel free to ask the instructor if you have questions in these programs.

Grading	Component	% Final Grade (411)	% Final Grade (511)
	Assignments	20	20
	Mid Term 1	15	15
	Mid Term 2	15	15
	Course Project	20	15
	Term Paper	5 (Extra Credit)	5
	Final Exam	30	30

Tentative Assignment schedule	Assignment	Topic
	Assignment 1	Introduction
	Assignment 2	Flexure design
	Assignment 3	Shear design
	Assignment 4	Torsion design
	Assignment 5	Development length
	Assignment 6	Serviceability
	Assignment 7	Columns
	Assignment 8	Two-way slabs

Each assignment will have one additional problem for CE511 students. This problem is also offered as extra credit problem for CE411 students.

CE 411/CE511 Course Syllabus - Tentative Schedule

#	Date	Topic	Textbook
1	January 17	<i>Chapter 1:</i> Introduction to RC Design	Ch. 1,2,3,R
2	January 19	<i>Chapter 1:</i> Introduction to RC Design	Ch. 1,2,3,R
3	January 24	<i>Chapter 1:</i> Introduction to RC Design	Ch. 1,2,3,R
4	January 26	<i>Chapter 1:</i> Introduction to RC Design	Ch. 1,2,3,R
5	January 31	<i>Chapter 2:</i> Behavior/Design of Flexural RC section	Ch. 4,5
6	February 2	<i>Chapter 2:</i> Behavior/Design of Flexural RC section	Ch. 4,5
7	February 7	<i>Chapter 2:</i> Behavior/Design of Flexural RC section	Ch. 4,5
8	February 9	<i>Chapter 2:</i> Behavior/Design of Flexural RC section	Ch. 4,5
9	February 14	<i>Chapter 3:</i> Shear & Torsion design of RC beams	Ch. 6,7
10	February 16	<i>Chapter 3:</i> Shear & Torsion design of RC beams	Ch. 6,7
11	February 21	<i>Chapter 3:</i> Shear & Torsion design of RC beams	Ch. 6,7
12	February 23	<i>Chapter 3:</i> Shear & Torsion design of RC beams	Ch. 6,7
---	February 28	FIRST MID-TERM (15 % of Total Grade)	
13	March 2	<i>Chapter 4:</i> Development lengths, Bar cutoffs	Ch. 8
14	March 7	<i>Chapter 4:</i> Development lengths, Bar cutoffs	Ch. 8
15	March 9	<i>Chapter 4:</i> Development lengths, Bar cutoffs	Ch. 8
---	March 14	SPRING BREAK	
---	March 16	SPRING BREAK	
16	March 21	<i>Chapter 5:</i> Serviceability (Deflection and cracking)	Ch. 9
17	March 23	<i>Chapter 5:</i> Serviceability (Deflection and cracking)	Ch. 9
---	March 28	SECOND MID-TERM (15 % of Total Grade)	
18	March 30	<i>Chapter 5:</i> Serviceability (Deflection and cracking)	Ch. 9
19	April 4	<i>Chapter 6:</i> Short columns	Ch. 11
20	April 6	<i>Chapter 6:</i> Short columns	Ch. 11
21	April 11	<i>Chapter 6:</i> Short columns	Ch. 11
22	April 13	<i>Chapter 7:</i> Long (Slender) columns	Ch. 12
23	April 18	<i>Chapter 7:</i> Long (Slender) columns	Ch. 12
24	April 20	<i>Chapter 7:</i> Long (Slender) columns	Ch. 12
25	April 25	<i>Chapter 8:</i> Two-way slabs	Ch. 13
26	April 27	<i>Chapter 8:</i> Two-way slabs	Ch. 13
27	May 2	<i>Chapter 8:</i> Two-way slabs	Ch. 13
---	May 4	Course Project Presentation	
---	Tuesday May 9	FINAL EXAM (30% of Total Grade) 7:30 to 9:30 am Centennial Engineering Center 1026	

- R-- Indicates other references provided by instructor in addition to textbook