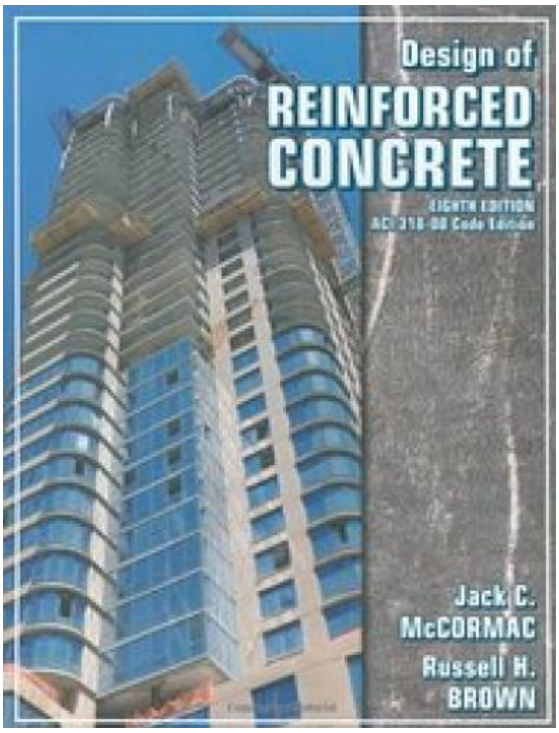
Design of Reinforced Concrete Structure



Class Meeting :(9:00 – 10:20 am) TR
Location: Health Science/ School of Nurse 206
CRN: 13027

Instructor: Methaq S. Abed, Ph.D., P.E.
Office: Engineering Building, room E 224
Phone: 747-6435
Email: msabed@utep.edu
Office Hours: 1:00 pm- 2:30 pm TR

Teaching Assistant: to be announced

Catalog Description: Reinforced concrete theory, design of beams, columns, slabs, footings, and retaining walls using current design specifications.

Prerequisites: CE 3343 and CE 3136

Textbook: **Design of Reinforced Concrete Structures**
ACI 318-08 Code Edition
Jack C. McCormac and James K. Nelson
Eighth Edition
John Wiley & Sons, Inc

Course Objectives: At the end of this course, the student will be able to apply the theory of reinforced concrete behavior to the analysis of simple structural elements. Also, the student will be able to design and detail simple structural elements satisfying the most current ACI 318 Building code.

Specifically student will develop the following skills:

1. Student will be able to analyze and design reinforced concrete members and assemblies of members for flexure, shear, and axial loads to compare with the ACI 318 provisions.
2. Student will be able to recall and apply knowledge from prerequisite courses (Structural analysis, CE materials, and Engineering Mechanics I) to the analysis and design of reinforced concrete members
3. Students will be able to scope and perform a structural design of a simple structural system using reinforced concrete.
4. Students will be able to work in teams to solve a complex engineering problem.
5. Student will get a better understanding of current issues in structural engineering.

These objectives mainly address ABET outcomes (a), (c), (d), (e) and to a lesser extent outcomes (f), (g) and (l)

Grades: Your grades will be assessed based on your performance in the following:

Mid-term exams **(45%)**
Group work : (**10%)**
Homework: (**10%**)
Project: (**10%**)
Final exam: (**25%**).

No Make-up exams will be given. **No late projects will be accepted. Late homework for only one week will be accepted with 20% deduction; late homework for more than one week will not be accepted.**

Grading Policy:

The grading scale is:	A	$\geq$ 88
	B	$\geq$ 78 but < 88
	C	$\geq$ 68 but < 78
	D	$\geq$ 58 but < 68
	F	< 58

Exam Dates

1st Exam	Thursday, Sept.15th
2nd Exam	Tuesday, Oct.18th
3rd Exam	Tuesday, Nov. 15th
Final Exam	Tuesday , Dec.6th (10:00 am- 12:45 pm)

Homework: Homework problems are due after finishing each chapter.

Your work will be read and scrutinized by others throughout your career as an engineer. Many times your calculations will be transformed into real physical objects. While mistakes and a lack of clarity are easily corrected on paper, they are much harder and more costly to correct once the concrete has set or the steel has been welded. In some instances your design calculations could become a legal document or a piece of evidence in a court of law. It is your responsibility that the work you prepare is presented in a legible, methodical, and logical manner. You will be required to submit organized, clear, concise work in this course, not to punish you or force you to do something you may consider a waste of time, but rather to get you in the habit of presenting your work in a professional manner. Remember that the purpose of your homework is to convince the grader and the instructor that you know how to get to the correct answer. Always look at your work and ask yourself, "does this paper demonstrate that I know what I am doing?"

Use only one side of a sheet. Staple each set of homework problems, do not fold.
Homework is individual. You can discuss the problems with your classmates, teaching assistant, or instructor, but do not copy solutions from each other.

You have to write and sign the Engineering Honor Code on all submitted assignments (homework, project) in order to get your assignment graded.

Engineering Honor Code

I have neither given nor received unauthorized aid on this examination, nor have I concealed any violations of the Honor Code.

Signature: _____

Student ID: Use the last four digit of your UTEP ID.

Projects: A team project will be assigned during the semester. The reports will be graded on the basis of design ingenuity, clarity, and use of graphics, grammar, overall quality and technical report. All team members must sign the reports and hand in a self-evaluation sheet of the team members indicating the percentage of effort put by each team member.

Group work: You have to submit a paper with the names of all participants in the group work for that day, and the answers of the assigned problems during the class. I prefer to take a picture of your group work before you submitted to me to use in case of losing the paper, and to ensure receiving you the correct grade.

CELL PHONES AND PAGERS OFF OR ON VIBRATE !!!!!!!!!!!!!!!!!!!!!!!!

Policy on Cheating

Students are expected to be above reproach in all scholastic activities. Students who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and dismissal from the university. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student, or the attempt to commit such acts@ (Regents= Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22). Scholastic dishonesty harms the individual, all students, and the integrity of the university, policies on scholastic dishonesty will be strictly enforced.

Topics covered

1.	Loads, Materials and Codified Design	(Chapter 1)
2.	Flexural Analysis and Design of Beams	(Chapter 2-5)
3.	Serviceability	(Chapter 6)
4.	Bond, Anchorage and Development Length	(Chapter 7)
5.	Shear and Diagonal Tension in Beams	(Chapter 8)
5.	Design of Short and Slender Columns	(Chapter 9-11)
6.	Design of Footings	(Chapter 12)

H.W.	**Assigned problems**
H.W. # 1	2.5 , 2.18, 2.20, 2.55,
H.W.# 2	3.9, 4.5, 4.20
H.W.# 3	5.7, 5.12, 5.15, 5.17, 5.21, 5.23, 5.31 , 5.32, 5.33
H.W.# 4	6.9, 6.11, 7.9,7.27
H.W# 5	8.6, 8.7, 8.9, 8.11, 8.15, 8.17
H.W.# 6	9.9, 9.13, 9.14
H.W.#7	10.14, 10.16 , 10.18, 10.23

Reinforced Concrete Codes

ACI Building Code 318
American Association of State and Highway Transportation Officials (AASHTO)
American Railroad Engineering Association (AREA)
Canadian Building Code
Ontario Highway Bridge Design Code
México City Design Code
Comité Euro-International du Betón
Eurocode

References

ASCE- Minimum design Loads for Buildings and Other Structures
ACI Manual of Concrete Practice
ACI Design Handbook
ACI Journal of Concrete Structures
ACI Journal of Concrete Materials
ASCE Journal of Structures
ASCE Journal of Engineering Materials
Canadian Journal of Civil Engineering
Specialty Conferences