Instructor	Dr. Mahmoud R. Taha, P.Eng, FACI Professor & Chair, CENT 3006 Tel: 277-1258 & e-mail: mrtaha@unm.edu
Outline	This class will be focused on design of new reinforced concrete structures using fiber reinforced polymer (FRP) reinforcement and strengthening of existing reinforced and prestressed concrete structures using FRP materials.
Lectures	Twice weekly: CENT 1032, **Tuesday and Thursday 5:30-6:45 pm**
Office Hours	Tuesday and Thursday 1:00 am -3:00 pm or by appointment You can always communicate with me using email
Learning Objectives	***After completing this course the student shall be able to*** 1- Understand reinforced concrete behaviour 2- Calculate the properties of FRP materials and identify the difference between FRP and other reinforced materials 3 - Perform design process in LRFD 4 - Solve mechanics problems using FRP 5- Design RC structures using FRP under bending and shear. 6 - Design of a strengthening system for RC structures using FRP. 7 -Check serviceability of RC structures with FRP 8- Write a critical review on research work produced on FRP
References	- The instructor will provide handouts to students. - There is no single textbook for the course. - Course materials are available in many technical papers and reports. - Students will need to get familiar with ACI design code
Assignments	- A total of five assignments will be given to students. A list of assignments is presented below. The following rules apply. - The 100% grade for assignments represents 20% of course grade. - Assignments shall be delivered by due date or marked of 50% max. - Assignments delayed for 1 week after due date will not be marked. - Electronic submission of assignments is not accepted.
Course project	- The course project shall be focused on RC structures w/FRP. - A project report is expected from every student. - Students will present the course project one lecture prior to the final exam. Two students can team up to make a project. - Further information will be available by October 2017.
Expected performance	Graduate students are expected to be familiar with computer structural analysis programs (e.g. SAP 2000, ANSYS, LS-DYNA) as well as computer engineering-programming environments such as MATLAB and MathCad.
Grading	Assignments: 20% Mid Term: 20% Course Project 25% Final Exam: 30% Instructor Evaluation: 5%
Suitable Accommodation	In accordance with University Policy 2310 and the Americans with Disabilities Act (ADA), academic accommodations may be made for

any student who notifies the instructor of the need for an accommodation. It is imperative that you take the initiative to bring such needs to the instructor's attention, as I am not legally permitted to inquire. Students who may require assistance in emergency evacuations should contact the instructor as to the most appropriate procedures to follow. Contact Accessibility Resource Center at 277-3506 for additional information.

If you need an accommodation based on how course requirement interact with the impact of a disability, you should contact me to arrange an appointment as soon as possible. At the appointment we can discuss the course format and requirements, anticipate the need for adjustments and explore potential accommodations. I rely on the Disability Services Office for assistance in developing strategies and verifying accommodation needs. If you have not previously contacted them I encourage you to do so.

CE 515 Course Syllabus - Tentative Schedule

Lecture #	Date	Topic
1	August 22	Introduction to RC Design
2	August 24	Introduction to RC Design
3	August 29	Introduction to RC Design
4	August 31	Introduction to RC Design
5	September 5	FRP Materials & Mechanics
6	September 7	FRP Materials & Mechanics
7	September 12	FRP Materials & Mechanics
8	September 14	Flexural design of FRP RC structures
9	September 19	Flexural design of FRP RC structures
10	September 21	Flexural design of FRP RC structures
11	September 26	Serviceability of FRP RC structures
12	September 28	Serviceability of FRP RC structures
13	October 3	Shear design of FRP RC structures
14	October 5	Shear design of FRP RC structures
15	October 10	Specifications of FRP Reinforcing Systems
---	October 12	**FALL BREAK**
---	October 17	**MID TERM EXAM**
16	October 19	FRP strengthening techniques & Materials
17	October 24	FRP strengthening techniques & Materials
18	October 31	FRP flexural strengthening of RC structures
19	November 2	FRP flexural strengthening of RC structures
20	November 7	FRP shear strengthening of RC structures
21	November 9	FRP shear strengthening of RC structures
22	November 14	FRP axial strengthening of RC structures
23	November 16	FRP axial strengthening of RC structures
24	November 21	Serviceability of strengthened RC structures
25	November 23	Serviceability of strengthened RC structures
26	November 28	FRP flexural strengthening of PC structures
27	November 30	FRP flexural strengthening of PC structures
28	December 5	Specifications of FRP Strengthening Systems
---	December 7	**Course Project presentation**
---	December 14	**FINAL EXAM, CENT 1032 - 5:30 to 7:30 pm**

CE 515 Assignments and their due dates

#	Assignments	Max grade
1	Introduction to RC Design & FRP Materials	20
2	Flexural Design of FRP Reinforced RC Beams	20
3	Serviceability & Shear Design FRP Reinforced RC Beams	20
4	Flexural strengthening with FRP	20
5	Shear strengthening with FRP & Serviceability	20