

CE 4363 - FUNDAMENTALS OF PRESTRESSED CONCRETE
Spring 2013

Prerequisite: CE 4347 Reinforced Concrete Design

Instructor: Dr. Shih-Ho Chao

Office: NH, RM 407
Phone: 817-272-2550
shchao@uta.edu

Lectures: From January 14 to May 1: Mondays and Wednesdays, 4:00 PM-5:20 PM, NH 111

Office Hrs:

- Mondays and Wednesdays, 5:20 PM-6:10 PM
- Questions via e-mail
- Or by appointment

Textbook:

Prestressed Concrete Analysis and Design—Fundamentals, third edition by A. E. Naaman, Technopress 3000 (<http://technopress3000.com/books>), Ann Arbor, Michigan, 2012.

References:

- ACI Committee 318 (2011), Building Code Requirements for Structural Concrete (ACI 318-11) and Commentary (ACI 318-11), American Concrete Institute, Farmington Hills, Michigan.
- AASHTO LRFD Bridge Design Specifications, 6th edition (2012), American Association of State Highway and Transportation Officials.

Course Outline:

1. Basic Concepts of Prestressed Concrete
2. Prestressing Materials: Steel and Concrete; High Performance Concrete
3. Allowable Stresses, Limited State Design, Load Balancing
4. Flexure: Working Stress Analysis and Design; Development Length; End Zone
5. Flexure: Ultimate Strength Analysis and Design
6. Design for Shear
7. Camber/Deflection Computation and Control
8. Analysis and Design of Composite Beams
9. Prestressed Concrete Bridges
10. Prestress Losses (if time allows)

GTA:

Regina Waweru. RM 137 CELB. regina.waweru@mavs.uta.edu. Send email to make appointments for questions.

Computer Programs:

- PGSuper (Prestressed Girder Superstructure Design and Analysis), can be downloaded from: http://www.dot.state.tx.us/business/contractors_consultants/engineering_software.htm. More information regarding this program can be found from <http://www.pgsuper.com>.
- *RISA-3D* (http://www.risatech.com/p_risa3d.html) is available in NH 239. The user's manual can be found under one of the folders. Please contact Lewis Crow (lcrow@uta.edu) if you have any problem in running this program. The computer room has a card swipe lock. I will send the department the list of student names & 1000 numbers for MavExpress to give you the access.

Homework:

- Homework problems will be assigned each Monday (or Wednesday) and are generally due on the following Monday (or Wednesday). All homework will be counted towards the final grade.
- Homework will be collected at the beginning of class on the due date. A late homework loses 30% per day.
- Students are encouraged to see the GTA and instructor about those assigned problems the student is having trouble with.
- Students are also encouraged to work in small groups to develop solutions to the problems but each student must write up his/her own homework. No credit will be given for homework copied or if your homework has been copied.

Term Project:

Project details will be announced sometime after the first mid-term exam. Final presentation of the term project is on Wednesday May 1 during lecture and the report (both hardcopy and electronic copy) is due on the same date.

Examinations:

There will be two mid-term exams (in class: including Distance Learning students) and a final examination (comprehensive exam). Open book and notes. All answers for the exam problems must be justified. It is important to have numerical answers within a reasonable accuracy (+ or -2%). Wrong numerical answers will not be assigned more than 80% of grade.

Scheduled exam dates are:

First Mid-term: March 6 (Wednesday), 4:00 PM-5:20 PM; NH 111

Second Mid-term: April 17 (Wednesday), 4:00 PM-5:20 PM; NH 111

Final exam: May 8 (Wednesday), 2:00 PM-4:30 PM; NH 111

Make-up Exam Policy:

Makeup exams are given only in extreme circumstances; examples of extreme circumstances are serious illness of the student (doctor's note required) or death in the family. I must be contacted before the exam if such a circumstance applies to you.

Grading:

The course grade will be based on:

20%	- Homework
15%	- Term project
40%	- Two mid-term exams
25%	- Final exam

100%	

Final exam will not be returned, but may be reviewed by students.

The grade assigned to the student's numerical average will be as follows:

(a)	80 to 100 average	=	A
(b)	70 to 79.9 average	=	B
(c)	60 to 69.9 average	=	C
(d)	50 to 59.9 average	=	D
(e)	< 50 average	=	F

Student Learning Outcomes:

- Ability to apply knowledge of mathematics, science, and engineering
- Ability to analyze and interpret data
- Ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- Ability to function on multi-disciplinary teams
- Ability to identify, formulate, and solve engineering problems
- An understanding of professional and ethical responsibility
- Ability to communicate effectively the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- Recognition of the need for, and an ability to engage in life-long learning
- Knowledge of contemporary issues
- Ability to use the techniques, skills and modern engineering tools necessary for engineering practice

Americans with Disabilities Act:

The University of Texas at Arlington is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 92-112 - The Rehabilitation Act of 1973 as amended. With the passage of federal legislation entitled Americans with Disabilities Act (ADA), pursuant to section 504 of the Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens. As a faculty member, I am required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with informing faculty of their need for accommodation and in providing authorized documentation through designated administrative channels. Information regarding specific diagnostic criteria and policies for obtaining academic accommodations can be found at www.uta.edu/disability. Also, you may visit the Office for Students with Disabilities in room 102 of University Hall or call them at (817) 272-3364.

Academic Integrity:

It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion 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, Series 50101, Section 2.2).

Student Support Services Available:

The University of Texas at Arlington supports a variety of student success programs to help you connect with the University and achieve academic success. These programs include learning assistance, developmental education, advising and mentoring, admission and transition, and federally funded programs. Students requiring assistance academically, personally, or socially should contact the Office of Student Success Programs at 817-272-6107 for more information and appropriate referrals.

Librarian to Contact:

Sylvia George-williams (Sylvia@uta.edu), Science & Engineering Librarian.

E-Culture Policy:

The University of Texas at Arlington has adopted the University email address as an official means of communication with students. Through the use of email, UT-Arlington is able to provide students with relevant and timely information, designed to facilitate student success. In particular, important information concerning registration, financial aid, payment of bills, and graduation may be sent to students through email. All students are assigned an email account and information about activating and using it is available at www.uta.edu/email. New students (first semester at UTA) are able to

activate their email account 24 hours after registering for courses. There is no additional charge to students for using this account, and it remains active as long as a student is enrolled at UT-Arlington. Students are responsible for checking their email regularly.

Note: I will be using email very often to send class handouts, homework assignments, and announcement; reply questions from students, etc. Please send me your preferred email address if you do not check UTA email.

Final Review Week:

A period of five university class days prior to the first day of final examinations is designated as Final Review Week. During this week, no new assignments will be given; however, previously assigned work may have a completion date during this week. In addition, no portion of the final examination shall be administered during the Final Review Week. Classes are held as scheduled during this week and materials covered in lectures during this week may be included in the final examination.

Grade Grievance Policy:

Grade grievances will be handled according to the policy described in the College of Engineering portion of the Catalog.