

Department of Civil Engineering
University of Texas Arlington

CE 3341- Structural Analysis

Instructor: Raad Azzawi, Ph.D., P.E./STR

Office: ERB 122

Office Hours: TuTh 1:00 pm – 4:00 pm

(Questions via email or by appointment)

Lecture: TuTh 6:00Pm – 7:50 pm

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Teaching Assistant: TBA

Course Content:

Structural analysis/design process, structural forms, and basic structural elements. Analysis of statically determinate structures including beams, trusses, frames, and composite structures, shear and moment diagrams, influence lines, and moving loads. Methods to compute deflections including double integration, moment area, and virtual work. Methods of analysis for statically indeterminate structures including consistent deformation, slope deflection and moment distribution. Use of structural analysis programs.

Class Reference Material (highly recommended):

Fundamentals of Structural Analysis, fourth edition by Leet, Uang, and Gilbert, McGraw-Hill., 2011

Dr. Azzawi lecture notes: available on Blackboard, (<http://www.uta.edu/blackboard>)

Prerequisites: CE 2313 Mechanics of Material I, with a grade of C or better

Tentative Course Outline:

| Day | Date | Syllabus |
|------|------------|--|
| TuTh | June 5-7 | Introduction , Structural Elements, Design Loads, Reactions, Free Body Diagrams |
| TuTh | June 12-14 | Trusses |
| TuTh | June 19-21 | Beams and Frames |
| TuTh | June 26-27 | Shear, Moment Diagrams and deflection curves |
| Tu | July 3 | Cables |
| Th | July 05 | Midterm I Exam |
| TuTh | July 10-12 | Moving Loads, Influence Lines |
| TuTh | July 17 | Deflection of Beams and Frames |
| Tu | July 19-24 | Columns: Fundamentals of column behavior, beam-columns, short column strength, interaction diagrams, Analysis of Indeterminate Structures(if time allows) |
| Tu | July 31 | Midterm II Exam |
| Th | August 09 | Term Project Presentation |
| | August | Final Exam (comprehensive) TBD |

As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. Raad Azzawi

Student Learning Outcomes:

This course will focus on the following student educational outcomes:

An ability to apply knowledge of mathematics, science, and engineering TI

An ability to identify, formulate and solve engineering problems TI

An understanding of professional and ethical responsibility CI

The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context CI

A recognition of the need for, and an ability to engage in life-long learning CI

A knowledge of contemporary issues CI

An ability to use the techniques, skills and modern engineering tools necessary for engineering practice TI

Covered Implicitly (CI): The outcome is implicitly covered

Covered Explicitly (CE): The outcome is explicitly covered

Tested Implicitly (TI): The outcome is covered and implicitly assessed for by one or more means (assignments, test questions, essay questions, presentation evaluations, lab reports, etc.)

Learning Objectives:

This course will enable students to:

1. To develop a skills to idealize, formulate, and analyze determinate and indeterminate structures (beams, trusses, and frames) using structural analysis methods.
2. To present methods to determine Structural Forms, and Basic Shear and Moment Diagrams, Deflected Shape
3. To develop skills in interpreting and predicting solutions from structural analysis.
4. To introduce computer-based applications for the analytical methods as presented.
5. To identify, formulate, and solve engineering problems.

Homework:

A number of relevant homework problems, grouped into one or more problem sets will be assigned on the class website or given in class at the end of lecture.

Assignments will be collected in class at the beginning of a lecture in hard copy. Late Homework will NOT be accepted unless arrangement has been made in advance with the instructor. Homework are suggested to be in a standard format. This includes: (a) statement of the problem (with a sketch); (b) quantities with given values; (c) quantities to be found; and (d) solution of the problem.

Work MUST be done in pencil and must be neat and readable. Draw a box around the answer(s). DO NOT WRITE IN THE BACK OF THE PAGE.

Make-up Exams Policy:

Makeup examinations are not given. If an examination is missed as a result of an illness or because of a University Authorized Absence, the weight of the missed examination will be added to the weight of the final examination when the class grade is determined. It is the responsibility of the student to provide acceptable, written documentation for absences that occur on the day of an examination. http://web.uta.edu/catalog/content/general/academic_regulations.aspx#5 in the UTA catalog at discusses University Authorized Absence. If arrangements are made well in advance, an examination can usually be taken before the scheduled time and a more lenient excuse policy is applied.

Make-up Classes:

Will be announced later.

Grades Criteria:

Students will be required to accumulate points from the following:

| | |
|-----------------------------|-------|
| Assignments | 7.5% |
| Midterm Exam I | 27.5% |
| Midterm Exam II | 27.5% |
| Term-Project & Presentation | 7.5% |

| | |
|------------|------|
| Final Exam | 30% |
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| Total | 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) | 90 to 100 average | = | A |
| (b) | 80 to 89.9 average | = | B |
| (c) | 70 to 79.9 average | = | C |
| (d) | 60 to 69.9 average | = | D |
| (e) | < 60 average | = | F |

Distance learning students need to take the exams (midterms and final) at the same day with the regular class. It is the responsibility of distance learning students to contact the distance learning office in UTA and register their testing centers at the beginning of the semester and coordinate with their testing center to schedule their exams. Electronic Devices/e-books are not allowed in exams and the final exam is comprehensive.

Policies:

In general, the class will be conducted in accordance with the policies given below. However, it is impossible to anticipate every possible circumstance. The instructor reserves the right to modify the given policies or to deviate from them in unforeseen or unusual circumstances. If there is a policy that you anticipate will affect you in a way that seems unfair, please bring it to the attention of the instructor before the end of the second week of class. After that, the reason for a student initiated change in policy must be compelling.

Dropping the Course:

Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. For Engineering students, added classes must be on the list approved by the academic advisor. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. Contact the Financial Aid Office for more information.

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. According to the UT System Regents' Rule 50101, §2.2, "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."

The College of Engineering has a "Statement on Ethics, Professionalism, and Conduct for Engineering Students" which may be downloaded from www.uta.edu/engineering/coees.doc. Each student is responsible for understanding and acting in accordance with this document.

Grade Grievances: The university policy regarding "Student Grievance Procedures Related to Grades" is explained in item 6 at http://web.uta.edu/catalog/content/general/academic_regulations.aspx#10.

Electronic Communication Policy:

The University of Texas at Arlington has adopted the University "MavMail" address as the sole official means of communication with students. MavMail is used to remind students of important deadlines, advertise events and activities, and permit the University to conduct official transactions exclusively by electronic means. For example, important information concerning registration, financial aid, payment of bills, and graduation are now sent to students through the MavMail system. All students are assigned a MavMail account. **Students are responsible for checking their MavMail regularly.** Information about activating and using MavMail is available at <http://www.uta.edu/oit/email/>. There is no additional charge to students for using this account, and it remains active even after they graduate from UT Arlington.

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.

Americans with Disabilities Act:

The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the Americans with Disabilities Act (ADA). All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

Emergency Exit Procedures:

Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit, which is located at the end of the hallway. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist handicapped individuals.