ARCH 3324 Structures-I
ARCH 5324

Spring 2017

Classroom: Room 401 CAPPA

Instructor: Madan Mehta Ph.D., P.E.
(mmehta@uta.edu)
Room No. 415, CAPPA
Office Hours: CAPPA Library
Fridays: 12:20 – 12:50 PM
Per appointment at other times

Important Dates

Test 1.....	**Jan. 30**
Test 2.....	**Feb. 13**
Test 3.....	**Feb. 27**
Test 4.....	**Mar. 20**
Test 5	**Apr. 3**
Test 6	**Apr. 24**
Last class	**May 5**

Final examination: May 8, 2017 (9:00–10:30 AM)

Course Objectives and Learning Outcomes

This course is the foundation for all advanced structures courses in the undergraduate and graduate architecture programs. In an engineering curriculum, this course is offered as two separate courses referred to as: (a) Statics and (b) Strength of Materials, each of one-semester duration. Therefore, the present course capsules the information, yet is rigorous enough and covers all important topics in the two engineering courses. After completing the course, a student should be able to appreciate the importance of sound structural knowledge for an architect, in addition to:

- Understanding the broad, qualitative relationship between a building and its structural form.
- Comprehending the differences between structural stability, strength, stiffness, and how they affect structural decision making by architects.
- Understanding the fundamental structural concepts (forces, moments, stresses and deformations) and their application to various types of structural elements using quantitative methods of structural engineering.
- Being able to analyze simple, statically determinate structural systems using mathematical techniques.
- Being able to determine bending moments, shear forces, deflections in statically determinate structural smembers.

Note that much of the course is quantitative in nature, requiring extensive number crunching. However, number crunching without understanding its purpose and application is meaningless. Therefore, the course also contains a great deal of qualitative (descriptive) structures. The two—quantitative and qualitative parts (in equal measure)—are fundamental to any real understanding of architectural structures.

UT-Arlington Description of Course Content

An introduction to architectural structures, including statics and strength of materials, with emphasis on design in timber.

Proficiency in Mathematics

The requirement for proficiency in mathematics is fairly elementary with the expectation that the student is reasonably familiar with basic trigonometric functions and basic algebra (particularly the solution of linear simultaneous equations with two unknown quantities). Please review these topics before the first day of class.

Required Text and Other Course Material

- Shaeffer R.E: *Elementary Structures for Architects and Builders*, Prentice Hall, (Fifth edition). The book is available at the University Bookstore. Students may also purchase it from Amazon or other sources. The text will be followed closely and the student is expected to have the book with him or her from the first day of class and every class session thereafter.
- Notes provided by the Instructor
- A simple scientific calculator is required for every class.

Schedule

Week	Date	Topic	Chapter
1	Jan. 18-19	Introduction. Structural Planning and Design Statics	**Chapter 1** **Chapter 2**
2	Jan. 23–27	Statics	**Chapter 2**
3	Jan. 30–Feb. 3	Statics	**Chapter 2**
4	Feb. 6–10	Statics Properties of Areas	**Chapter 2** **Chapter 3**
5	Feb. 13–17	Properties of Areas	**Chapter 3**
6	Feb. 20–24	Stress and Strain	**Chapter 4**
7	Feb. 27– Mar. 3	Shear and Moment	**Chapter 6**
8	Mar. 6–10	Shear and Moment	**Chapter 6**
	Mar. 13-17	**Spring Break**	
9	Mar. 20–24	Flexural Stresses	**Chapter 7**
10	Mar. 27–31	Flexural Stresses	**Chapter 7**
11	Apr. 3–Apr. 7	Shear Stresses	**Chapter 8**
12	Apr. 10–14	Shear Stresses Deflection	**Chapter 8** **Chapter 9**
13	Apr. 17–21	Beam Design	**Chapter 10**
14	Apr. 24 – 28	Compression Members	**Chapter 11**
15	May 1–5	Compression Members	**Chapter 11**

Breakdown of Grades and Grading Policy

Tests (5x 25)	125
Homework Assignments	15 (Submission dates to be announced during the semester)
Attendance	10
Final Examination	25
Maximum points	**175**

Letter grade A will be given to a student with a score of 90% or higher; Letter grade B to a student with a score of 80% to 89.9%; Letter grade C to a student with a score of 70% to 79.9%; Letter grade D to a student with a score of 60% to 69.9%; Letter grade F to a student with a score of less than 60%.

Each test will deal with the material covered in the class after the previous test, i.e., Test 2 will assess the students on topics covered after Test 1, Test 3 on the material covered after Test 2, and so on. The final exam. will be comprehensive.

Of the six tests, only five tests will count toward the final grade. Each test will be of 45-minute duration. All homework assignments will count toward the final grade. **There will be no makeup test or makeup final examination.**

Tests, homework assignments, and final examination will be graded based on the student showing an understanding of the topic. Obtaining the correct answer to a question by chance or fluke, through incorrect understanding of the concepts, may receive a failing grade for the question. Neatness of presentation in all work is essential.

Attendance Policy

The course is highly sequential, i.e., each topic requires a knowledge of the previous topics covered in the class. Therefore, every lecture must be attended, and the student must be in the classroom by the scheduled starting time and sign the roll sheet hung on the classroom wall. The roll sheet may be removed by the course Teaching Assistant 5 minutes after the scheduled starting time. A student coming after the removal of the roll sheet is welcome to attend the class but will be considered absent.

The grade on attendance will be based on the number of absences with first 3 absences fully excused (no question asked), i.e., a student with ≤ to 3 absences will get 10 out 10 attendance points. Each additional absence will invoke one negative point, i.e., a student with ≥ 13 absences will get zero out of 10 attendance points.

Use of Laptop Computers

The use of laptop computers for taking lecture notes in the classroom is not permitted at any time.

Course Drop Policy

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. 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. For more information, contact the Office of Financial Aid and Scholarships (http://wweb.uta.edu/aao/fao/).

Disability Accommodation

UT 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), The Americans with Disabilities Amendments Act (ADAAA),* and *Section 504 of the Rehabilitation Act*. 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 disability. Students are responsible for providing the instructor with official notification in the form of **a letter certified** by the Office for Students with Disabilities (OSD). Only those students who have officially documented a need for an accommodation will have their request honored. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting:

The Office for Students with Disabilities, (OSD) www.uta.edu/disability or calling 817-272-3364. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability.

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
UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring,major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at http://www.uta.edu/universitycollege/resources/index.php.

Grade Grievance Policy
If a student has any grievance about the grade on a test, quiz, homework or sketchbook assignment, he/she must contact the Instructor promptly—no later than the following class period. If the Instructor is satisfied that a genuine error was made, the grade will be changed. If not, the Instructor will try to explain to the student the rationale behind the grade. If the student does not agree with the Instructor's decision, he/she must submit a written request to the Instructor explaining why a higher grade is deserved. This must be done within one week of the student receiving the grade on the test or homework assignment in question beyond which no grievance will be entertained.

Use of Aerosol Materials, Paints, and Other Hazardous Chemicals
Due to health and safety regulations and University policy, no spray paints, adhesives and other hazardous aerosol products are allowed in the building. Furthermore, no painting or use of flammable or other hazardous chemicals is allowed anywhere in the building, including and especially the fire stairs. Use of such chemicals is a hazard to your health and safety and that of other building occupants. It is also against the law. Spray painting and similar activities are only permissible in the approved ventilated spray booths in the School Shop. Violations of this policy will be subject to both academic and civil penalties.

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 staircase, which is located to the left of the entrance door to this classroom. 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 individuals with disabilities.