

**Instructor:**

Matt Fajkus, AIA, NCARB, LEED AP
matt.fajkus@austin.utexas.edu 512-232-1961
Office Hours: GOL 4.128, Tue/Thu 1:00 pm – 2:00 pm, or by appointment.

Lectures: 2:00 – 3:30 Tue/Thu, GOL 3.120

Teaching Assistants:

Prathan Shah: prathan@utexas.edu (Tuesday Lab)
Jacob Hurt: jchurt@utexas.edu (Thursday Lab)

Course Description

Construction IV (ARC 435) is largely a continuation of the content from the previous construction sequence courses, with a shift into larger structures and systems. The course focuses on the integration of technical and tectonic issues into the design process, in order to gain an understanding of methods in which structure as well as other technical aspects of contemporary buildings can be used as a driver or at least a factor in design process to create more intelligent and innovative spaces, rather than an afterthought which compromises design intent.

Structure can be defined as a building's load-bearing mechanism which keeps it standing upright upon the ground, but *structure* can also be defined as an overall ordering system, or as an arrangement or interrelationship of components, both tangible and intangible. The course aims to examine ways in which large scale structural and construction techniques influence architectural design, and vice-versa, as well as how the pedagogy of construction positions itself within contemporary practice.

Qualitative and quantitative analyses are both employed to understand building constructive logic as well as calculations which examine the forces imparted upon structures in various conditions. By obtaining a stronger understanding of a building's structural and tectonic behavior, students will acquire new tools by which to innovate in the design process. Structural calculations are examined as a way to gain a basic understanding of the field of engineering, to allow for better architect/engineer collaboration throughout an architect's career, as well as to better prepare students for licensure exams (ARE). In addition to understanding structural behavior abstractly, the course will examine historical and especially contemporary case study buildings which employ intelligent designs by taking on structural and tectonic issues in innovative ways.

University Honor Code:

The core values of the University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.

Disabilities:

Please notify your instructor of any adaptation you may require to accommodate a specific physical need. You will be requested to provide documentation to the Dean of Students' Office, in order that the most appropriate accommodations can be determined. Specialized services are available on campus through the Services for Students with Disabilities, also found via the web at <http://deanofstudents.utexas.edu/ssd/>.

Format

- Lectures will cover the significant material introduced in the required reading assignments.
- Homework assignments will be issued most weeks and will be due the following week, in class, after the student has had the opportunity to attend the lab sessions which will review example problems similar in nature to those assignments. Late homework will not be accepted.
- In addition to the weekly assignments, constructed projects will constitute the fundamental coursework.
- Homework problems will be accomplished in groups of 3 or less.* Any individual not performing a commensurate share of the work may be eliminated from the group but is still responsible to satisfy all homework requirements.
- Projects, on the other hand, will be required to be completed by each individual student unless noted otherwise.
- Quizzes may be given without notice and may cover reading assignments and/or any material presented in any prior and/or current lectures. The format of the quizzes, either open or closed book, will be determined by the instructor at the time of the quiz.
- Exams will be closed book and may extract any information from all lectures, labs, and reading assignments within a given period determined by the instructor.

Skills & Experience Flag

This course carries a flag for **Quantitative Reasoning**, as administered by the Center for Skills Experience Flags in the Undergraduate Studies program at The University of Texas at Austin.

The **Quantitative Reason Flag** indicates that the course is designed to equip students with skills that are necessary for understanding the types of quantitative arguments expected to be encountered in a young professional life. Students should therefore expect a portion of their grade to be come from the use of quantitative skills to analyze real-world problems.

Texts

REQUIRED

Structures by Daniel Schodek, 6th Edition (Required)

Grading

The categories listed below constitute the following percentage of final course grades:

Homework/Quizzes - 10%
Exam 1 - 20%
Exam 2 - 20%
Final Exam - 20%
Projects - 30%

Each item above will have its own grading criteria that will be issued with each assignment or task that will be numerically graded and scaled with the final course grades established by the following ranges:

A : 93-100%
A- : 90-92%
B+ : 87-89%
B : 83-86%
B- : 80-82%
C+ : 77-79%
C : 73-76%
C- : 70-72%
D+ : 67-69%
D : 63-66%
D- : 60-62%
F : below 60%

Construction IV : ARC 435L

COURSE SCHEDULE : FAJKUS : SPRING 2019

Week	Day	Date	Lecture Topics	Notes	Reading (approximate pages) Structures by Schodek (6 th Ed.)
1	T	Jan 22	Introduction	No Labs	
	Th	Jan 24	Statics Review + Case Study	No Labs	p. 3-33, p. 561-579
2	T	Jan 29	Preliminary System Selection 1	Issue Project 1	Review Chapter 2
	Th	Jan 31	Preliminary System Selection 2		
3	T	Feb 5	Truss Introduction: Triangulation, Fuller, etc.		
	Th	Feb 7	Maxwell Diagram		
4	T	Feb 12	Truss Systems + Method of Joints		p. 145-170
	Th	Feb 14	Truss Systems: Method of Sections + Component Selection		
5	T	Feb 19	Gable Trusses	Project 1 Due	
	Th	Feb 21	Case Study		
6	T	Feb 26	EXAM 1	EXAM 1 7-10pm	
	Th	Feb 28	Beams + Flexure Theory	Issue Project 2 No Labs	p. 249- 261
7	T	Mar 5	Rigid Frames 1		p. 347-358, p. 374-404
	Th	Mar 7	Rigid Frames 2		
8	T	Mar 12	K-Braced + X-Braced Frames		p. 533-544
	Th	Mar 14	Eccentric Braced Frames		
9	T	Mar 19	Spring Break – No Class		
	Th	Mar 21	Spring Break – No Class		
10	T	Mar 26	Shear Walls 1		
	Th	Mar 28	Shear Walls 2		
11	T	Apr 2	Case Study		
	Th	Apr 4	EXAM 2	EXAM 2 7-10PM	
12	T	Apr 9	Arches, Cables, Gables 1		p. 201-216, 224-244, 284-285
	Th	Apr 11	Arches, Cables, Gables 2		
13	T	Apr 16	Wind 1		p. 112-115
	Th	Apr 18	Wind 2		p. 529-533
14	T	Apr 23	Earthquake 1	Project 2 Due	p. 115-122
	Th	Apr 25	Earthquake 2		p. 551-559
15	T	Apr 30	Domes 1		p. 460-476
	Th	May 2	Domes 2 / Shells / Plates		p. 436-440
16	T	May 7	Case Study		
		May 8-10	Final Studio Reviews		
		TBD	EXAM 3 – During Official Final Exam Day/Time		

Attendance:

Most class meetings will be devoted to lectures on key course content, so regular attendance and active participation are important. You may miss three classes and/or lab sessions – for any reason – without penalty. Each additional absence will lower your grade by 5%. Six or more absences will likely result in a failing grade for the course. Because our time in class is limited, promptness is important, and you may be counted absent if you are late to class. Please contact the teaching assistants if you expect to be late or miss class, or as soon as reasonably possible in the case of a medical emergency.

Absence for military service:

In accordance with section 51.9111 of the Texas Education Code, a student is excused from attending classes or engaging in other required activities, including exams, if he or she is called to active military service of a reasonably brief duration. The maximum time for which the student may be excused has been defined by the Texas Higher Education Coordinating Board as “no more than 25 percent of the total number of class meeting or the contact hour equivalent (not including the final examination period) for [a course] at the beginning of the period of active military service.” The student will be allowed a reasonable time after the absence to complete assignments and take exams.

A student who misses classes or other required activities for the observance of a religious holiday should inform the teaching assistants as far in advance of the absence as possible, so that arrangements can be made to complete an assignment within a reasonable time after the absence.