

Fall 2019 - ARC 385M - Construction III

Instructor: Ulrich Dangel | dangel@utexas.edu

Office Hours: Tuesdays 2:00 - 3:00pm, GOL 4.108, Tel. 512-471-5157

Teaching Assistant: Lena Page | pagelena@utexas.edu

Lecture: TTH 12:30 - 2:00pm, WMB 5.102, Lab: TH 7:00 - 10:00pm, PAR 304

Course Summary

This course is an introduction to analyzing the behavior of basic structures through quantitative methods of conventional structural analysis and design. It functions as an applied statics course and emphasizes schematic calculations for the design of components and connections of various structural systems. In addition, rules of thumb for the preliminary sizing of structural members will be introduced. The analysis aspects of this course will examine the structural behavior and application of beams and columns in timber, steel, and reinforced concrete. Throughout the course, the student will be required to make assessments in the areas of material, form, and fabrication.

The primary objective of the course is to provide the student with the ability to use methods and analyses, along with rules of thumb and present-day conventions, to determine the preliminary sizing and evaluation of a total structural system. Consequently, the student will learn to make a judgment on which structural systems are appropriate and applicable to a specific design solution.

NAAB Student Performance Criteria

B.4 Technical Documentation, B.5 Structural Systems, B.8 Building Materials and Assemblies

Format

- Lectures will cover the significant material introduced in the required reading assignments.
- Homework will be assigned at the end of each lab session and will be due at the beginning of the following lab. Lab sessions will review example problems similar in nature to those assignments. Late homework assignments will be reviewed but not credited.
- In addition to the weekly assignments, projects will constitute the fundamental course work. Late project assignments will be graded, but will be lowered by half a letter grade for each day late.
- Quizzes may be given without notice to cover reading assignments, which should be completed prior to the presentation of the material in lecture.
- Exams will be closed book and will cover all lectures, labs, and reading assignments within a given period.
- All course material (course description, syllabus, assignments, projects, readings, grades, etc.) will be available on Canvas at canvas.utexas.edu

Course Requirements

Statics and Strength of Materials for Architecture and Building Construction, Onouye + Kane, 4th edition

Building Structures Illustrated, Ching, 2nd edition

The Architect's Studio Companion, Allen, 6th edition

Reserved Texts:

Architectural Structures, Place; *Building Construction Illustrated*, Ching; *Building Skins*, Schittich; *Building Structures*, Ambrose; *Concrete Construction Manual*, Kind-Barkauskas; *Constructing Architecture*, Deplazes; *Construction Materials Manual*, Hegger; *Designing the Exterior Wall*, Brock; *Elementary Structures for*

Architects and Builders, Shaeffer; *Facade Construction Manual*, Herzog; *Fundamentals of Building Construction*, Allen; *Glass Construction Manual*, Balkow; *Interactive Structures (DVD)*, Vassigh; *Manual of Multi-Storey Timber Construction*, Kaufmann; *Masonry Construction Manual*, Pfeifer; *Olin's Construction: Principles, Materials & Methods*, Leslie; *Roof Construction Manual*, Schunck; *Simplified Engineering for Architects and Builders*, Ambrose + Tripeny; *Steel Construction Manual*, Schulitz; *Structures*, Schodek; *Structures – Or Why Things Don't Fall Down*, Gordon; *Timber Construction Manual*, Herzog; *Why Buildings Fall Down*, Levy; *Why Buildings Stand Up*, Salvadori

Grading

Final grades are derived from homework and quizzes, three semester exams, and the semester projects. Grading is based on a 100-point scale as follows:

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	59 and below

The individual grades accumulated over the semester are averaged towards the final grade as follows:

Homework	10%
Exam 1	20%
Exam 2	20%
Exam 3	20%
Projects	30%

NO INCOMPLETES WILL BE ALLOWED.

Attendance Policy

Attendance is mandatory in all lectures and labs. Students can have three (3) unexcused absences – for any reason – without penalty. Each additional absence, regardless of the reason, will lower the final course grade by one full letter grade.

Religious Observances

A student shall be excused from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for the purpose. A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence. University policy requires students to notify each of their instructors as far in advance of the absence as possible so that arrangements can be made.

By UT Austin policy, you must notify the instructor of the pending absence at least fourteen days prior to the date of a religious holy day. If you must miss a class, an examination, an assignment, or a project in order to

observe a religious holy day, you will be given an opportunity to complete the missed work within a reasonable time after the absence.

Academic Integrity

Each student in the course is expected to abide by the University of Texas Honor Code: "As a student of The University of Texas at Austin, I shall abide by the core values of the University and uphold academic integrity." Representing the work of others as your own, including plagiarism, is taken very seriously at UT. You must cite your sources when you use the words or ideas of others; otherwise you will be guilty of plagiarism and subject to academic disciplinary action, including failure of the course. You are responsible for understanding UT's Academic Honesty and the University Honor Code which can be found at the following web address: <http://deanofstudents.utexas.edu/conduct/academicintegrity.php>.

Personal Pronouns

Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name, unless they have added a "preferred name" with the Gender and Sexuality Center (<http://diversity.utexas.edu/genderandsexuality/publications-and-resources/>). The instructor will gladly honor your request to address you by a name that is different from what appears on the official roster and by the gender pronouns you use (she/he/they/ze, etc). Please advise the instructor of any changes early in the semester so appropriate updates may be made to their records.

Mental Health and Support Services

Taking care of your general well-being is an important step in being a successful student. If stress, test anxiety, racing thoughts, feeling unmotivated, or anything else is getting in your way, there are options available for help:

- In-house CARE counselor (see below)
- For immediate support
 - Visit/call the Counseling and Mental Health Center (CMHC):
M-F 8am-5pm | SSB, 5th floor | 512-471-3515 | cmhc.utexas.edu
 - CMHC Crisis Line:
24/7 | 512-471-2255 | cmhc.utexas.edu/24hourcounseling.html
- Free services at CMHC:
 - Brief assessments and referral services: cmhc.utexas.edu/gettingstarted.html
 - Mental health & wellness articles: cmhc.utexas.edu/commonconcerns.html
 - MindBody Lab: cmhc.utexas.edu/mindbodylab.html
 - Classes, workshops, and groups: cmhc.utexas.edu/groups.html

CARE PROGRAM

Counselors in Academic Residence (CARE) Program places licensed mental health professionals within the colleges or schools they serve in order to provide better access to mental health support for students who are struggling emotionally and/or academically. Abby Simpson (LCSW) is the assigned CARE counselor for the School of Architecture. Faculty and staff may refer students to the CARE counselor or students may directly reach out to her. Please leave a message if she is unavailable by phone.

Abby Simpson, LCSW | BTL 114B | 512-471-3115 (M-F 8am-5pm)
https://cmhc.utexas.edu/CARE_simpson.html

Students with Disabilities

This class respects and welcomes students of all backgrounds, identities, and abilities. Instructors are committed to creating an effective learning environment for all students, but this is possible only if you discuss your needs early. Any student with a documented disability who requires academic accommodations should

contact Services for Students with Disabilities at 471-6259 (voice) or 512-410-6644 (Video Phone) as soon as possible to request an official letter outlining authorized accommodations. For more information, visit <http://ddce.utexas.edu/disability/about/>.

BEVOCAL

BeVocal is a university-wide initiative to promote the idea that individual Longhorns have the power to prevent high-risk behavior and harm. At UT Austin all Longhorns have the power to intervene and reduce harm. To learn more about BeVocal and how you can help to build a culture of care on campus, go to: <https://wellnessnetwork.utexas.edu/BeVocal/>.

BCAL

Concerns regarding the safety or behavior of fellow students, Teaching Assistants (TA), or Professors can be reported to the Behavior Concerns Advice Line (BCAL): 512-232-5050. Calls can be made anonymously. If something doesn't feel right, it probably isn't. Trust your instincts and share your concerns.

Title IX Reporting:

Title IX is a federal law that protects against sex and gender-based discrimination, sexual harassment, sexual assault, sexual misconduct, dating/domestic violence and stalking at federally funded educational institutions. UT Austin is committed to fostering a learning and working environment free from discrimination in all its forms. When sexual misconduct occurs in our community, the university can:

1. Intervene to prevent harmful behavior from continuing or escalating.
2. Provide support and remedies to students and employees who have experienced harm or have become involved in a Title IX investigation.
3. Investigate and discipline violations of the university's relevant policies:

<https://titleix.utexas.edu/policies>.

Faculty members and certain staff members are considered "Responsible Employees" or "Mandatory Reporters," which means that they are required to report violations of Title IX to the Title IX Coordinator. **Your instructor is a Responsible Employee and must report any Title IX related incidents** that are disclosed in writing, discussion, or one-on-one. Before talking with any faculty or staff member about a Title IX related incident, be sure to ask whether they are a responsible employee. If you want to speak with someone for support or remedies without making an official report to the university, email advocate@austin.utexas.edu. For more information about reporting options and resources, visit <https://titleix.utexas.edu> or contact the Title IX Office at titleix@austin.utexas.edu.

Emergency Evacuation

In the case of emergency evacuation:

- Occupants of buildings on The University of Texas at Austin campus are required to evacuate buildings when a fire alarm is activated. Alarm activation or announcement requires exiting and assembling outside.
- Students should familiarize themselves with all exit doors of each classroom and building they may occupy. Remember that the nearest exit door may not be the one used when entering the building.
- Students requiring assistance in evacuation shall inform their instructor in writing during the first week of class. In the event of an evacuation, follow the instruction of faculty or class instructors.
- Reentry into a building is prohibited unless given instructions by the following: Austin Fire Department, The University of Texas at Austin Police Department, or Fire Prevention Services offices.

Information regarding emergency evacuation routes and emergency procedures can be found at: www.utexas.edu/emergency.

Fall 2019 - ARC 385M - Construction III

Instructor: Ulrich Dangel

Schedule

Week			Topic	Notes	Reading*
1	29-Aug	TH	Course Introduction	No Lab	
2	3-Sep	T	Statics		Ch. 1.1 - 1.6, 2.1 - 2.4
	5-Sep	TH	Structural Properties of Areas	Project Part 1 issued	Ch. 6.1 - 6.4
3	10-Sep	T	Stress and Strain		Ch. 5.1 - 5.4
	12-Sep	TH	Shear and Moment		Ch. 2.5 - 2.6, 7.1 - 7.5
4	17-Sep	T	Bending Stress		Ch. 8.1 - 8.2, 8.6
	19-Sep	TH	Shearing Stress	Project Proposal Part 1 due	Ch. 8.3 - 8.4
5	24-Sep	T	Deflection/Compression Members		Ch. 8.5, 9.1 - 9.2
	26-Sep	TH	Compression Members		Ch. 8.7, 9.5
6	1-Oct	T	Properties of Wood/Beam Design		Ch.4.1, Ch. 5.1 - 5.2, 5.4 - 5.7 (Ambrose + Tripeny)
	3-Oct	TH	Exam 1 7:00 - 9:00pm	No Lecture/No Lab	
7	8-Oct	T	Preliminary Structural Design (Gregory Brooks)		
	10-Oct	TH	Column Design/Wood Connections		Ch. 9.4
8	15-Oct	T	Wood Connections		Ch. 19 (Ambrose)
	17-Oct	TH	Case Study: The Core	Project Part 1 due	
9	22-Oct	T	Properties of Steel	Project Part 2 issued	Ch. 8 (Ambrose + Tripeny)
	24-Oct	TH	Beam and Column Design in Steel		Ch. 9.3
10	29-Oct	T	Steel Connections I		Ch. 10.2
	31-Oct	TH	Steel Connections II		Ch. 10.1, 10.3
11	5-Nov	T	Beam Design in Concrete		Ch. 13.1 - 13.5 (Ambrose + Tripeny)
	7-Nov	TH	Exam 2 7:00 - 9:00pm	No Lecture/No Lab	
12	12-Nov	T	Beam and Column Design in Concrete		Ch. 13.6 - 13.8, 14, 15 (Ambrose + Tripeny)
	14-Nov	TH	Foundation Design I	No Lab/Project Part 2 Pinup	Ch. 16 (Ambrose + Tripeny)
13	19-Nov	T	Foundation Design II		
	21-Nov	TH	Project Presentations I	Project Part 2 due	
14	26-Nov	T	Project Presentations II		
	29-Nov	TH	Thanksgiving	No Lab	
15	4-Dec	T	No Class		
	6-Dec	TH	No Class	No Lab	
	14-Dec	SAT	Exam 3 2:00 - 4:00pm		

Structural Fundamentals

Wood

Steel

Concrete

Project

Schedule subject to change

* Reading in bold is from the course textbook, all other reading is available on Canvas