Fall 2018 - ARC 385M - Construction III

Instructor: Ulrich Dangel Email: dangel@utexas.edu
Office Hours: Tuesdays 2:00 - 3:30pm, GOL 4.108, Tel. 512-471-5157
Teaching Assistant: Robbie Anderson (Robbie.anderson@utexas.edu)
Lecture: TTH 12:30 - 2:00pm, SUT 2.112, 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, essential design criteria and assembly techniques of the building envelope and its relationship to the overall structural system will be explored.

The analysis aspects of this course will examine the structural behavior and application of support members and columns in timber, steel, reinforced concrete, and masonry. 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 and envelope assemblies are appropriate and applicable to a specific design solution.

NAAB Student Performance Criteria
B.4 Technical Documentation, B.5 Structural Systems, B.7 Building Envelope Systems and Assemblies, 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 ed. (required, available at Coop)

Reserved Texts:
Fundamentals of Building Construction, Allen; *The Architect's Studio Companion*, Allen; *Glass Construction Manual*, Balkow; *Building Structures*, Ambrose; *Simplified Engineering for Architects and Builders*, Ambrose + Tripeny; *Designing the Exterior Wall*, Brock; *Building Construction Illustrated*, Ching; *Constructing Architecture*, Deplazes; *Structures – Or Why Things Don't Fall Down,* Gordon; *Construction Materials Manual*, Hegger;

Facade Construction Manual, Herzog; *Timber Construction Manual*, Herzog; *Concrete Construction Manual*, Kind-Barkauskas; *Olin's Construction: Principles, Materials & Methods*, Leslie; *Masonry Construction Manual*, Pfeifer; *Architectural Structures*, Place; *Why Buildings Fall Down*, Levy; *Why Buildings Stand Up*, Salvadori; *Building Skins*, Schittich; *Structures,* Schodek; *Elementary Structures for Architects and Builders,* Shaeffer; *Steel Construction Manual*, Schulitz; *Roof Construction Manual*, Schunck; *Interactive Structures (DVD)*, Vassigh;

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 to complete an examination, assignment, or a project within a reasonable time after the absence. A student who fails to complete missed work within the time allowed will be subject to the normal academic penalties.

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.

Students with Disabilities
Students with disabilities who require special accommodations must obtain a letter that documents the disability from the Services for Students with Disabilities area of the Office of the Dean of Students (471-6259 voice or 471-4641 TTY for users who are deaf or hard of hearing). This letter should be presented to the instructor in each course at the beginning of the semester and accommodations needed should be discussed at that time. Five business days before an exam the student should remind the instructor of any testing accommodations that will be needed.

Behavior Concerns Advice Line (BCAL)
If you are worried about someone who is acting differently, you may use the Behavior Concerns Advice Line to discuss by phone your concerns about another individual's behavior. This service is provided through a partnership among the Office of the Dean of Students, the Counseling and Mental Health Center (CMHC), the Employee Assistance Program (EAP), and The University of Texas Police Department (UTPD). Call 512-232-5050 or visit http://www.utexas.edu/safety/bcal.

Policy on Academic Integrity
Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. For further information, visit the SJS website at http://deanofstudents.utexas.edu/sjs or call 471-2841.

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Schedule

Week			Topic	Notes	Reading*	
1	30-Aug	TH	Course Introduction	No Lab		
2	4-Sep	T	Statics		**Ch. 1.1 - 1.6, 2.1 - 2.4**	Structural Fundamentals
	6-Sep	TH	Structural Properties of Areas	Project Part 1 issued	**Ch. 6.1 - 6.4**	
3	11-Sep	T	Stress and Strain		**Ch. 5.1 - 5.4**	
	13-Sep	TH	Shear and Moment		**Ch. 2.5 - 2.6, 7.1 - 7.5**	
4	18-Sep	T	Bending Stress		**Ch. 8.1 - 8.2, 8.6**	
	20-Sep	TH	Shearing Stress	Project Proposal Part 1 due	**Ch. 8.3 - 8.4**	
5	25-Sep	T	Deflection/Compression Members		**Ch. 8.5, 9.1 - 9.2**	
	27-Sep	TH	Compression Members		**Ch. 8.7, 9.5**	
6	2-Oct	T	Building Envelope: Historic Development		pp. 9 - 16 (Building Skins)	Envelope
	4-Oct	TH	**Exam 1 7:00 - 9:00pm**	No Lab		
7	9-Oct	T	Building Envelope: Design Fundamentals		Part A (Facade Construction Manual)	Wood
	11-Oct	TH	Properties of Wood/Beam Design	Project Part 1 due	**Ch.4.1,** Ch. 5.1 - 5.2, 5.4 - 5.7 (Ambrose + Tripeny)	
8	16-Oct	T	Column Design/Wood Connections	Project Part 2 issued	**Ch. 9.4**	
	18-Oct	TH	Wood Connections		Ch. 19 (Ambrose)	
9	23-Oct	T	Properties of Steel		Ch. 8 (Ambrose + Tripeny)	Steel
	25-Oct	TH	**Exam 2 7:00 - 9:00pm**	No Lab		
10	30-Oct	T	Beam and Column Design in Steel		**Ch. 9.3**	
	1-Nov	TH	Steel Connections I	No Lab/Project Part 2 Pinup	**Ch. 10.2**	
11	6-Nov	T	Steel Connections II		**Ch. 10.1, 10.3**	
	8-Nov	TH	Beam Design in Concrete		Ch. 13.1 - 13.5 (Ambrose + Tripeny)	Concrete
12	13-Nov	T	Beam and Column Design in Concrete		Ch. 13.6 - 13.8, 14, 15 (Ambrose + Tripeny)	
	15-Nov	TH	**Exam 3 7:00 - 9:00pm**	No Lab		
13	20-Nov	T	Building Envelope: Materials + Properties		Part B 1.1 - 1.7 (Facade Construction Manual)	Envelope
	22-Nov	TH	**Thanksgiving**	No Lab		
14	27-Nov	T	Project Presentations 1	Project Part 2 due		Project
	29-Nov	TH	Project Presentations 2			
15	4-Dec	T	No Class			
	6-Dec	TH	No Class	No Lab		

Schedule subject to change

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