

ARCH 5333: Construction II

Fall 2016

Instructor: Madan Mehta, B.Arch. Ph.D., P.E.

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Faculty Profile:

<https://www.uta.edu/profiles/dr-madan-mehta>

Classroom: Materials and Assembly Suite, School of Architecture Annex (CMPC 104)

Meeting Times: M, W & F---1:00–1:50 PM

Instructor's Office Hours: M, W, F 12:20 to 12:40 PM, School Library

Important Dates

Test 1	Sep. 19	Sketch book 1 submission	Sep. 19
Test 2	Oct. 17	Sketch book 2 submission	Oct. 17
Test 3	Nov. 14	Sketch book 3 submission	Nov.14
Final Exam.	Dec. 12, 2016 (12:00 – 1:30 PM)		

Project submissions and presentations, and homework submissions as announced during the semester.

Reading Material

This is not a textbook course. Therefore, several sources must be referenced. Some sources are:

- Reference 1Mehta, Scarborough and Armpriest: *Building Construction—Principles, Materials, and Systems*, **Second Edition, 2012, Pearson**, available in UTA Book Store.
- Reference 2Patterson and Mehta: *Roofing Design and Practice* (Prentice Hall), School of Architecture Library.
- Reference 3Patterson and Mehta: *Wind Loads on Low-Slope Roofs*, Roof Consultants Institute Foundation (RCIF), School of Architecture Library.
- Reference 4Websites.
- Reference 5 Lecture Notes

Suggestions for additional references will be provided by the Instructor during the semester.

Introduction

The course deals with advanced construction assemblies and builds on the first course on construction (ARCH 5323: Construction-I). It is a lecture-, project-, seminar-based course, and requires a certain amount of independent research by the student in completing the projects and preparing for the tests. The course deals with several different types of materials and construction assemblies with a focus on building envelope (facades and roofing). Important life-safety issues related to assemblies, sustainable materials and construction, outline specifications and cost control will be covered briefly.

Note that this is not a course on construction drawings. Therefore, some of your drawings will need to be three-dimensional (isometrics and axonometrics), and in some instances, well-drawn freehand sketches, will be required—in fact all that is typically needed to illustrate one's comprehension of construction systems and

assemblies.

Course Topics

Movement Control

Control of expansion, contraction, and other types of movement in buildings and building components. Building codes and movement control. (Reference 1, Chapter 9).

Cold-Formed Steel in Residential and Commercial Construction

Cold-formed steel (CFS) components. Use of CFS in load-bearing applications. Use of CFS in nonbearing applications—interior partitions and exterior cladding and curtain walls. Life safety issues in CFS construction. Reference 1, Chapter 20, and Instructor's Notes.

Roofing

Both low-slope and steep roofing systems will be dealt with. With 4 lectures by the instructor and one by the guest instructor: Joel Lewallen (Roof Consultant), and some self reading, the students will be brought up-to-date with current roofing practices. Reference 1, Chs. 33, and References 2 and 3. Life safety issues (wind uplift and drainage) in roof design.

Masonry (Loadbearing and Nonbearing)

Clay and concrete masonry construction. Masonry mortar. Brick veneer for residential buildings. Concrete masonry units and joint reinforcement. Concrete masonry in load-bearing and nonbearing walls. Reinforced concrete masonry. Masonry structural details with concrete, wood and steel structures. Life safety issues in masonry construction systems. Reference 1, Chs. 24 to 26.

Exterior Wall Cladding

Brick veneer curtain wall; precast concrete curtain wall, GFRC curtain wall, stucco, EIFS and stone cladding. Life safety issues with respect to wall cladding. Reference 1, Chs. 27 to 29.

Windows and Curtain walls

Windows (wood, aluminum, steel and vinyl). Glass-aluminum curtain walls. Reference 1, Chs. 30 to 32.

Floor Coverings

Various types of floors—wood, terrazzo, vinyl and linoleum, carpet, marble and granite, brick paving, concrete paving. Life safety issues in flooring. Reference 1, Ch. 36 and instructor notes.

Ceilings

Suspended ceilings in commercial buildings.
Reference, Ch. 37.

Cost Control

Conceptual cost estimating and cost control in building construction.

Breakdown of Grades

A student's grade in the course will be based on the following work.

- Tests (2 out of 3 tests) 50
- Sketchbooks (3) 45
- Student project 20
- Homeworks 15
- Attendance (Wks 1-13) 10
- Attendance (last 3 weeks) 5
- Final Exam. 25

Total ... 170

A \geq 90%; 89% \geq B \geq 80%; 79% \geq C \geq 70%; 69% \geq D \geq 60%. F < 60%.

Grade Grievance

If a student has any grievance about the grade on a test, homework, or a project, 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, a change of grade will follow. 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 outlining why he/she deserves a higher grade. This must be done within one week of the student receiving the grade on the test or other assignment, beyond which no grievance will be entertained.

Project

A student may choose to work on one of the two types of projects in groups of up to two students:

- *Research project*, requiring an in-depth study of a construction system. The project's submission consists of two components: (a) a well-documented paper and (b) presentation to the class. The topic of research is to be decided between the student (group) and the Instructor.
- *Construction drawings and outline specifications of an assembly*. The choice of assembly and the extent of coverage is to be decided between the student (group) and the Instructor.

Attendance Policy

It is not possible to fully assess a student's learning of the course material through conventional means (tests, quizzes, sketchbook submissions, projects, etc.). Therefore, regular attendance in the course is required and expected. Attendance will be recorded by the student signing the roll sheet posted near the classroom entrance. A student coming more than 5-minutes late should not sign the sheet.

Instructor-Student Communication

UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business. All students are assigned a MavMail account and are responsible for checking the inbox regularly.

Learning Disability

A student requiring accommodation based on documented disability should meet with the Instructor in the first week of the semester for necessary accommodation, as per the University's rules. 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 (front or rear of this room). When exiting the building during an emergency, one should never take an elevator but should use the stairwells. The Instructor will help students to find the safest route for evacuation and will make arrangements to assist handicapped individuals.

Lecture and Test Schedule

Week/Date	Topic
1 Aug. 26 – 31	Movement control in buildings; Joints and sealants.
2 Sep. 2 - 9	Thermal bridging in building envelopes. Continuous Insulation (CI)—a major code requirement. Use of cold-formed steel (CFS) in building construction. HSW issues in CFS construction (IECC code and fire resistance).
3 - 5 Sep. 12 - Sep. 28	Introduction to Roofing. Roof membranes. Roof insulation. Roof decks; Life safety issues in roofing. Design for roof drainage; Design for fire; Design for wind and hail; Roof details.

Test 1 Sep. 19 (1:00 – 2:00 PM)

(Date TBA) Guest lecture by Joel Lewallen, Johns Manville Roofing Systems

6 - 8 Sep. 30 – Oct. 14	Introduction to masonry; Concrete masonry and clay masonry units; Mortar; Grout; Joint reinforcement. Load bearing masonry and load-bearing reinforced concrete construction; Tilt-up wall construction.
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(Date TBA) Guest lecture by Benchmark Harris, P.E., Chris Huckabee Inc., Fort Worth, Texas

9 - 10 Brick veneer facades, Thermal bridging: Detailing of shelf angles.
Oct. 17 - 28 Precast concrete and glass-reinforced concrete.

Test 2 Oct. 17 (1:00 – 2:00 PM)

11 - 13 Portland cement stucco; Exterior insulation and finish systems (EIFS)
Oct. 31 – Detailing of Portland cement stucco
Nov. 25 Material Glass; Glass-aluminum curtain walls; Doors and windows.

Test 3 Nov. 14 (1:00 – 2:00 PM)

14 - 16 **Guest lecture/Visit to Curtain Wall Testing Facility, Carrollton, TX (TBA)**
Nov. 28 - Student Project Presentations
Dec. 7

Final Exam Dec. 12 (12:00- 1:30 PM)