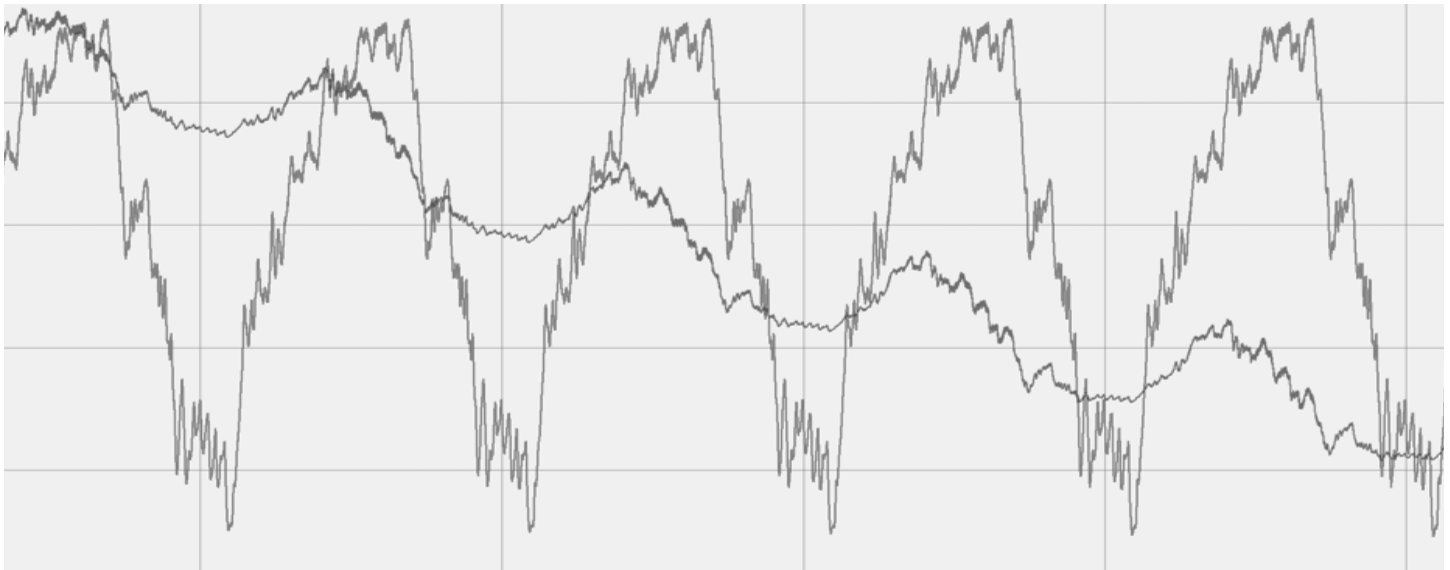


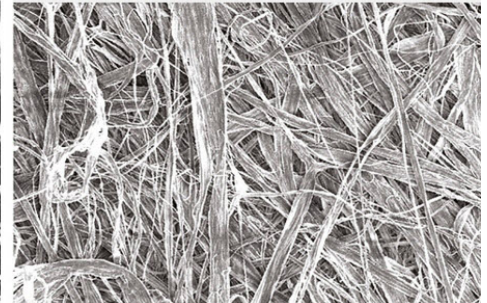
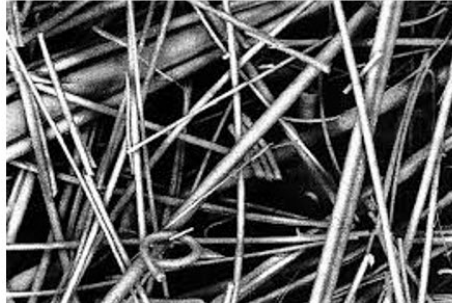
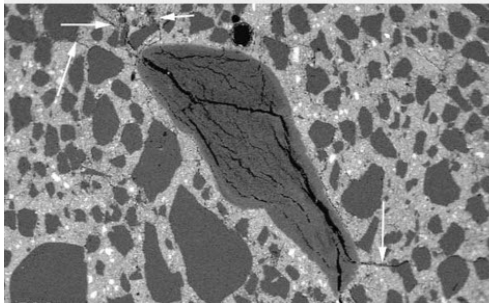
Construction V



Layer/Material Name:	Concrete w/c 0,5
Bulk density [lb/ft ³]:	144.084
Porosity [ft ³ /ft ³]:	0.16
Spec. Heat Capacity [Btu/lb°F]:	0.203019
Thermal Conductivity [Btu/hft°F]:	0.982242
Permeability [perm in]:	0.719553

Layer/Material Name:	Polyisocyanurate Insulation
Bulk density [lb/ft ³]:	1.65434
Porosity [ft ³ /ft ³]:	0.99
Spec. Heat Capacity [Btu/lb°F]:	0.351103
Thermal Conductivity [Btu/hft°F]:	0.0138669
Permeability [perm in]:	2.50097

Layer/Material Name:	vapor retarder (0.1perm)
Bulk density [lb/ft ³]:	8.11563
Porosity [ft ³ /ft ³]:	0.001
Spec. Heat Capacity [Btu/lb°F]:	0.549346
Thermal Conductivity [Btu/hft°F]:	1.32892
Permeability [perm in]:	0.00392683



Instructor: **Keith A. Simon, AIA, CPHC, BECxP, CxA+BE, LEED AP**

Office: SUT 4.116
office hours by appointment:
512-800-4485
ksimon@utexas.edu

TA: **Jayme Gritch**
office hours by appointment:
jgritch817@gmail.com

Lectures: GOL 2.110
Tuesdays, Thursdays 12:30-2pm

Course: ARC 335M-00805

Syllabus and Course Policies:

Course Description

As a conclusion to the construction class series, this course's general goal is to crystallize the accumulated knowledge and explore further the analysis of how buildings are conceived and detailed, with special emphasis on material selection, control layers, and improved overall understanding of building enclosures and assemblies.

Learning Outcomes:

- Learn the importance of architectural detailing as a critical component of the building design process.
- Understand the fundamentals of heat, air, moisture, and vapor transport through building assemblies.
- Learn to anticipate constructability challenges with detailing.
- Understand how codes, standards, and specifications guide the architectural design process.

Prerequisite

Architecture 435L with a grade of at least C and registration for ARC 561C. This course is restricted to students in the School of Architecture. This course is required of all students pursuing the B Arch, but is not required of all School of Architecture students.

Required Text

While a traditional text will not be used for the class, articles and other readings will be assigned throughout the course at the discretion of the instructor.

Required Software

During the second half of the course (starting on March 26th) students will be required to use WUFI Pro 1d hygrothermal simulation software by Fraunhofer IBP. The software is available on a limited number of computer lab machines or a free version of the software may be downloaded at this site:

<https://wufi.de/en/webshop/>

Students are encouraged to apply for a student version of WUFI Pro early in the course.

Students with Disabilities

Students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities, 471-6259:

Based in the philosophy that all students should be assured equal access and opportunity, Services for Students with Disabilities works to eliminate physical, instructional and attitudinal barriers by providing reasonable accommodations and fostering awareness within the University community.

Please notify the instructor of any special needs.

Attendance Policy

Attendance is expected at all lectures. Absences are excused only for medical conditions or personal or family emergencies. Three absences or more will result in a zero for participation (drop of one letter grade for the term).

University of Texas 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. For more information about academic integrity read:

http://deanofstudents.utexas.edu/sjs/acint_student.php.

Religious Holy Days

Notify the instructor of any pending absence at least fourteen days prior to the date of observance of a religious holy day. If you must miss a class, an examination, a work 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.

Course Assignments

Homework assignments and readings are assigned weekly and are typically due the following Tuesday by the beginning of class. Homework consists of a variety of problem-based questions requiring calculations, sketch exercises, observation and measurements and may include, but are not limited to using hand-held equipment and sensors, model construction and mini-case studies. Homework and readings are due at the beginning of lecture, unless otherwise announced. Homework submitted late will earn reduced credit (-10%). Homework more than one week late will not be accepted and scored a zero.

Course Grading

Grade Minimum Scores: 94.00% (A), 90.00% (A-), 87.00% (B+), 84.00% (B), 80.00% (B-), 77.00% (C+), 74.00% (C), 70.00% (C-), 67.00% (D+), 64.00% (D), 61.00% (D-), 0.00% (F)

Homework:	45%	Weekly assignments
Midterm	20%	Multiple choice, design vignettes, essays, etc. (closed-book)
Studio Final Review	20%	Integration of technical knowledge into design/studio final review
Participation	15%	Includes good attendance, completion of activities, participation in class discussions and helping to foster a positive learning environment for the class

*Syllabus subject to change

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General Grading Criteria

A/A- Grade Work - Excellent

Original and thoughtful concept that is clearly communicated. Comprehensive and well-developed work goes well beyond project requirements. Demonstrates in-depth understanding of the subject matter including readings. Exemplary graphs, figures, images, sketches, models, etc. supported by cited references.

B+/B/B- Grade Work - Above Average

Thoughtful concept that is well communicated. Comprehensive and well-developed work goes beyond project requirements. Demonstrates understanding of the subject matter including readings. Includes appropriate graphs, figures, images, sketches, models, etc. supported by cited references.

C+/C Grade Work - Average

Has a concept and shows developed work that meets project requirements. Demonstrates understanding of the subject matter. Includes adequate graphs, figures, images, sketches, models, etc. supported by cited references.

C-/D+/D/D- Grade Work - Poor

Meets some of the project requirements. Work is not fully developed. Demonstrates some understanding of the subject matter. Inadequate graphs, figures, images, sketches, models, etc..

F Grade Work - Fail

Doesn't meet project requirements. Does not demonstrate understanding of subject matter.

Participation Grading Criteria

100/100

Excellent attendance and always a positive attitude. If any classes were missed – made arrangements with instructor to make up the work. Helped create a positive learning environment for their peers. Revisits issues or ideas that need more attention. Helps the group stay on track. Draws out ideas and concerns of others. This score is reserved for exceptional students.

90/100

Excellent attendance and always a positive attitude. If any classes were missed – made arrangements with instructor to make up the work. Helped create a positive learning environment for their peers. This score is reserved for approximately top 10% of students.

80/100

Good attendance and a positive attitude. If any classes were missed – made arrangements with instructor to make up the work. Helped create a positive learning environment for their peers. This score achieved by students meeting the basic requirements of participation.

70/100

May have missed more than one class and/or did not complete an assignment. Sometimes absent or late. Inconsistently prepared. This score achieved by students doing the minimum requirements for participation.

60/100

Missed more than one class and did not complete more than one assignment. Frequently absent or late without notice. Little or no preparation. Observes passively and rarely says anything. Gives the impression of wanting to be somewhere else. This score achieved by students barely passing.

SIMON	CONSTRUCTION	V	SPRING	TERM	2019	UTSoA	
BUILDING SCIENCE FUNDAMENTALS							
#	Date	Day	Topic	Assignment	Comprehensive Studio		
1	01.22.19	T	Detailing Workshop	HW-1: Existing Sections	F 1/25 - Integration Intro		
2	01.24.19	TH	Building Leakage Forces				
3	01.29.19	T	Water Management Part I	HW-2: Wall to Ground	Programming		
4	01.31.19	TH	Water Management Part II				
5	02.05.19	T	Heat Transfer Part I	HW-3: Roof to Wall	Schematic Design		
6	02.07.19	TH	Heat Transfer Part II				
7	02.12.19	T	Air Transport I	HW-4: Window Integration I	Concept + Site Strategy		
8	02.14.19	TH	Air Transport II				
9	02.19.19	T	Vapor Transport I	HW-5: Window Integration II			
10	02.21.19*	TH	Chemical Compatibility				
SYSTEMS AND ASSEMBLIES							
11	02.26.19	T	Windows and Fenestration	HW-6: Window Integration III	Program + Massing		
12	02.28.19	TH	Roofing				
13	03.05.19*	T	Chemical Compatibility	Production			
14	03.07.19*	TH	Water-Resistive Barriers				
15	03.12.19	T	NO CLASS (optional review session)		M/W - Mid Review		
16	03.14.19	TH	Midterm Exam				
spring break							
ANALYSIS							
17	03.26.19	T	Detailing Workshop	HW-7: Thermal Comfort	Structure Development		
18	03.28.19	TH	Zoom In Pinup				
19	04.02.19	T	WUFI Workshop	Massing + Envelope			
20	04.04.19	TH	WUFI Workshop				
ENCLOSURE DESIGN							
21	04.09.19	T	Pookie Extravaganza	W 4/10 DD Review			
22	04.11.19	TH	Intro to PHIUS				
23	04.16.19	T	PHIUS Case Study	HW-8: PHIUS	Detail Development		
24	04.18.19	TH	PHIUS Pinup				
25	04.23.19	T	Case Study	HW-9: WUFI Analysis	M 4/22 Pinup Cross-Review		
26	04.25.19	TH	Site Visit				
27	04.30.19	T	Design + Details	Production			
28	05.02.19	TH	Design + Details				
29	05.07.17	T	NO CLASS	Final Reviews			
	05.09.17	TH	NO CLASS				

Additional Recommended Texts

Allen, Edward; Rand, Patrick. **Architectural Detailing: Function, Constructibility, Aesthetics**, Third Edition. Wiley, 2016. ISBN: 978-1-118-88199-6

Allen, Edward; Iano, Joseph. **The Architect's Studio Companion: Rules of Thumb for Preliminary Design**, 4th Edition. Wiley, 2006. ISBN: 978-0-471-73622-6

Allen, Edward; Iano, Joseph. **Fundamentals of Building Construction Materials and Methods**, 3rd Edition. Wiley, 1999. ISBN: 0-471-18349-0

Allen, Edward. **How Buildings Work**, 3rd Edition. Oxford, 2005. ISBN-13: 978-0-19-516198-4

Brookes, Alan J. **Cladding of Buildings**, Third Edition, Spon Press (Taylor & Francis Group), 2003. ISBN: 0-419-22170-0

Burnett, Eric; Straube, John, **Building Science for Building Enclosures**, Building Science Press, 2005. ISBN: 0-9755127-4-9

Ching, Francis D.K. **Building Construction Illustrated**, Fourth Edition, Wiley, 2008. ISBN: 978-0-470-08781-7

Ford, Edward R. **The Details of Modern Architecture, Volumes 1: 1890-1932**. The MIT Press, 2003. ISBN: 978-0-262-56201-0

Ford, Edward R. **The Details of Modern Architecture, Volume 2: 1928-1988**. The MIT Press, 2003. ISBN: 978-0-262-56202-7

Ford, Edward R. **Five Houses, Ten Details**. Princeton Architectural Press, 2009. ISBN: 978-1-56898-826-9

Lstiburek, Joseph. **The Builder's Guide to Hot-Humid Climates**, Building Science Press, 2005. ISBN: 0-9755127-3-0

Mehta, Madan; Patterson, Stephen. **Roofing Design and Practice**, Prentice-Hall, Inc., 2001. ISBN: 0-13-025995-0

Ramsey/Sleeper. **Architectural Graphic Standards**, Eleventh Edition, Wiley, 2007. ISBN: 978-0-471-70091-3

Schittich, Christian. **in Detail Building Skins**, Birkhauser, 2006. ISBN: 978-3-7643-7640-6

Additional Resources:

Whole Building Design Guide:
<http://www.wbdg.org/resources/>

Building Science Corporation:
<https://buildingscience.com/>
free articles and publications
Bookstore
Events, Sign-up for monthly article by Dr. Joe Lstiburek, PE

Building Science Laboratories
<http://learnbuildingscience.com/upcoming-lab-events/>
Continued Education
Monthly webinars

RDH Building Sciences
<http://rdh.com/research-forensics/articles-papers-presentation/>
Articles, Papers, Presentations

Local Builder Matt Risinger
<https://www.youtube.com/user/MattRisinger>
Residential scale how-to videos

Local Engineer Kristof Irwin
The Building Science Podcast
<https://www.positiveenergy.pro/building-science-podcast/>