

Course Number: **ARC6611**
Course Title: **Advanced Materials and Methods**
Term: Spring 2024
Professor: Lisa Huang, AIA, Instructional Assistant Professor
email: lisahuang@ufl.edu
Faculty office: Office hours via Zoom Wednesday 12:00 PM – 2:00 PM [<https://ufl.zoom.us/j/7545544884>]
Credits: 3
Meeting times: Wednesday 3:00pm-6:00pm
Section Number: 424G
Course Delivery: Via Zoom (for Orlando and JaxLab students)

SYLLABUS

Course Description and Role within the Sequence

"Humans are defined, to an extraordinary degree, by their expressions of immaterial ideals through material forms." - Daniel Miller

This course is not different from your previous Materials and Methods courses in that it focuses on helping you understand the set of questions that need to be asked as you transform your inventive design ideas towards the realities of construction. However, it is different because it is not organized around a catalog of materials or construction techniques. Instead, it focuses student energy of the understanding of knowledge in architecture. Every attempt to translate an idea into a constructable reality requires the designer to hypothesize about the materials and processes that might be used in its construction. Or perhaps the idea began with a material and the designer must grapple with the methods of training the material into a form. Knowledge of the conventions of construction provides a foundation for developing construction details, helps you to consider alternatives that might improve their function and quality, and gives you the ability to evaluate their potential for success. However, the title of the course is Advanced Materials and Methods of construction. We will take the "advanced" part seriously. We will review and implement the conventions and technical knowledge you should have gained in the previous semesters of Materials and Methods, but this class will concentrate on the more conceptual theoretical understanding of architecture as it is resolved in detail.

You will be taught, in the sense that a portion of this class is delivered through readings and discussions. However, my greater responsibility in this course is to be your guide. This means that I will direct you and provide input, but the impetus for movement in your project is yours. The lab will run like a studio. You will be given time to share what you've been working on. It is intended that this lab work in together with your integrated design studio. However, it must be more than that you will be expected to conduct research, write, and draw speculatively about architecture, material, and detail. Sometimes your investigation will not run parallel with your studio work, but I do expect it to collide with it occasionally.

The curriculum relies on and commingles with Design Studio, Environmental Technology, Structures, History and Theory courses.

Objectives + Goals

- Provide theoretical and historical context for understanding and making technical decisions about materials and methods of construction through readings, discussion, and lecture-based content.
- To deepen technical knowledge of building materials assemblies and construction methods including appropriateness and limitations for certain applications.
- To examine and practice how design intent is developed and recorded in the development of construction documents.
- To develop research-based processes for developing specific building structures, envelopes, and systems.
- Develop criteria for evaluation for the appropriate utilization of assemblies based on design intent and performance criteria.
- Develop the ability to communicate advanced, precise, or complex design intent in documentation including the incorporation of appropriate types of information at relevant levels of precision at a variety of scales of representation: plan, elevation, section, and detail.

Topical Outline

- To make you knowledgeable of the issues involved in detailing and assembling buildings
- To help you understand methods for ensuring the quality of the materials of that construction and the means of its documentation,
- To be able to use and understand the codes which control a building's occupation, safety, and stability

Course Schedule

W1	Introduction
W2-5	Practicalities of Tectonic Thinking
W6-9	Theories of Tectonic Thinking + Project 1
W10	Spring Break (no class)
W11-15	Practice + Theory: Project 2
W16	Studio final Review (no class)
W17	Submit final archive via Canvas

Attendance

Attendance is mandatory and is recorded. Chronic absences and/or tardiness will have a negative impact on your grade, with a loss of up to 5% over your overall score (see grade breakdown below). If you must miss class, it is up to you to get the assignments and notes from your classmates. In the event of serious illness, family or personal crisis, arrangements can be made for attendance, missed exams or work. On this point, it is important for you to let me know of your circumstances as soon as possible.

Performance + Grading

Course grades will be decided by the Independent Exercises, two Projects, final written assignment and portfolio, and

attendance/ participation in class. The weighting of these components with regards to the final grade is as follows:

Reading, Response, and Participation	25.00%
Project 1 (Precedent Study)	30.00%
Project 2 (Studio Project Implementation)	40.00%
Attendance	5.00%

Every effort will be made to give timely and appropriate feedback for your performance. If you have questions about your grade, you may schedule a conference to review your scores, attendance and performance.

Grading Scale:

Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
Numeric Grade	93-100	90-92	87-89	83-86	80-82	77-79	73-76	70-72	67-69	63-66	60-62	0-59
Quality Points	4.0	3.67	3.33	3.0	2.67	2.33	2.0	1.67	1.33	1.0	0.67	0.0

To clarify the system of grading for classes:

- A Outstanding work only
- A- Close to outstanding
- B+ Very Good Work
- B Good Work
- B- Good work with some problems

- C+ Slightly Above Average Work
- C Average Work
- C- Average Work with some problems
- D+ Poor Work with some effort
- D Poor Work
- E Inadequate Work

The current UF grading policies for assigning grade points can be found at <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>. An incomplete grade may be assigned at the discretion of the instructor as an interim grade only in cases of extreme extenuating circumstances. The University of Florida maintains a student honor code regarding cheating and use of copyrighted materials produced by others. Specific policies can be found at: <http://www.dso.ufl.edu/judicial/honorcode.php>.

Course Evaluations

In the last three to four weeks of the semester, you will receive an electronic notification and hyperlink that will allow you to complete online course evaluations. Your thoughtful responses to these questions will help inform both the content and conduct of the course in subsequent semesters. Note that all responses are confidential and are not connected with individual respondents in any way. Summary evaluation information is not available for review by the faculty until AFTER course grades are issued and is not connected to individual respondents in any way.

Policy on Retaining Work

Please note that the University of Florida College of Design, Construction and Planning policies state that students' work may be retained indefinitely for academic purposes. You should be prepared for the instructor to ask that it be exhibited and/or photographed during or after the term. Having your work retained for photography and/or exhibition is evidence of its quality and value to the school. You will always be able to either retrieve your original work or retrieve it temporarily to make copies/photograph it for your own personal purposes.

Students with Special Needs

Students with special physical needs and requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. All attempts to provide an equal learning environment for all will be made

Counseling + Emergency Contacts

Police / Fire / Medical Emergency – 911

Orlando Police Department Non-Emergency Number: 321.235.5300

Consult CityLab-Orlando Student Resources for Emergency contact information.

UF's Behavioral Consultation Team meets regularly to assess and develop intervention plans for students, faculty or staff in distress and to assist in interventions as needed.

http://www.ufsa.ufl.edu/faculty_staff/crisis_information_emergencies/behavioral_consultation_team

The UF Emergency Management website provides a wide range of information and resources designed to prepare you to take action in case of an emergency. <https://emergency.ufl.edu/>

See Student Code here, <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>

If you have a concern that might be a violation of University policy, report that information (with any evidence) to the DSO office for potential charging consideration. Reports can be submitted online via the following link:

https://forms.dso.ufl.edu/public_report/index.php/pid619837?

In addition to these safety measures, UF provides a number of resources designed to support faculty, staff and students who might be experiencing distress:

UMatter, We Care is the university's umbrella program to support UF's caring culture. Families, faculty, staff and students may email umatter@ufl.edu seven days a week for assistance. <http://www.umatter.ufl.edu/>

The UF Counseling and Wellness Center provides ongoing counseling support and crisis and emergency services to UF students, as well as assistance recognizing signs of distress in students. <https://counseling.ufl.edu>

The Office of Victim Services provides 24/7 support to UF students, faculty, staff and visitors who may have been a victim of a crime. <http://www.police.ufl.edu/victim-services/>

To learn more about how UF works to ensure our campus remains safe, please see the UF Together for a Safe Campus report. https://police.ufl.edu/media/policeufl.edu/reports/UPD_Safe_Campus2017_ONLINE_Final_9_29_17.pdf

Note: Florida law generally bans firearms on campus. CityLab facilities are under UF control and are therefore part of campus. Anyone may anonymously report illegal or unethical activities via UF's Web Reporting System.

<https://www.reportlineweb.com/Welcome.aspx?Client=UF>

Required and Recommended Textbooks

From time to time, books, magazines, and articles will be provided by the faculty for in-class use. In addition, you are encouraged to bring relevant reference materials to the studio for your own use and for the use of your colleagues.

Please utilize the UF Library Resources. If you need a book that is located in a Gainesville Campus library please forward the title and call number if to me (from the Catalog website) and I will get it for you as soon as I can.

The UF e-learning portal may be used for sharing of certain common references available in electronic format. It will be accessible at <https://lss.at.ufl.edu/>. Tutorial resources are available to you at this location also. Be sure to make use of "lynda.com" for help with Adobe products, Revit Architecture, Rhino, V-Ray, etc.

Required textbooks:

Allen, Edward, and Joseph Iano. *Fundamentals of Building Construction: Materials + Methods*. Hoboken, N.J: John Wiley & Sons, 2019.

Allen, Edward, and Patrick Rand, *Architectural Detailing: Function, Constructability, Aesthetics*. 3rd Edition. Hoboken, N.J: John Wiley & Sons, 2013.

Ching, Francis D. K. *Building Construction Illustrated*. Fourth or fifth edition, 2014. Print. *This is the classic visual guide to the basics of building construction*.

Deplazes, Andrea. *Constructing Architecture: Materials, Processes, Structures, a Handbook*. Basel: Birkhäuser, 2005. Print.

Watts, Andrew. *Modern Construction Handbook*. Second or third edition, 2013. Print.

Some recommended texts are as follows:

Watts, Andrew. *Modern Construction Handbook*. Current Edition. Print. *An excellent source for 3-dimensionally illustrated assemblies of somewhat less than typical building systems. Available and recommended for your library.*

Zaera-Polo, Alejandro, and Anderson, Jeffrey. *The Ecologies of the Building Envelope*. Actar Publishers, NY. 2021. Print. \$45

Hegger, Manfred. *Construction Materials Manual*. Basel: Birkhäuser, 2006. Print. (eBook available to download free through UF VPN)

Schittich, Christian, and Florian Musso. *Building Simply*. München: Edition Detail, Institut für internationale Architektur-Dokumentation, 2005. Print. (eBook available to download free through UF VPN)

Antonelli, Paola, Anna Burckhardt, Emily Hall, Jennifer Liese, and Neri Oxman. 2020. *The Neri Oxman material ecology catalogue*.

Other texts:

Smith, Ryan E. *Prefab Architecture: A Guide to Modular Design and Construction*. Hoboken, N.J: John Wiley & Sons, 2010. Print.

Hailey, Charlie. *Design/build with Jersey Devil: A Handbook for Education and Practice*. , 2016. Print.

Sawyers, Paul. *Intermodal Shipping Container Small Steel Buildings*. Place of publication not identified: Paul Sawyers, 2008. Print.

Frampton, Kenneth, and John Cava. *Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture*. Cambridge, Mass: MIT Press, 1995. Print.

Alread, Jason, and Thomas Leslie. *Design-tech: Building Science for Architects*. 2nd Edition. Oxford: Architectural Press, 2014. Print.

Cohen, Jean-Louis, and Gerard M. Moeller. *Liquid Stone: New Architecture in Concrete*. New York: Princeton Architectural Press, 2006. Print.

Schröpfer, Thomas, and James Carpenter. *Material Design: Informing Architecture by Materiality*. Basel: Birkhäuser, 2011. Print.

Thomas, Katie L. *Material Matters: Architecture and Material Practice*. London: Routledge, 2007. Print.

Loos, Adolf. *Spoken into the Void: Collected Essays, 1897-1900*. Cambridge, Mass: Published for the Graham Foundation for Advanced Studies in the Fine Arts, Chicago, Ill., and the Institute for Architecture and Urban Studies, New York, N.Y., by MIT Press, 1982. Print.

Excerpts 'Building Materials', 'The Principle of Cladding'.

Weston, Richard. *Materials, Form and Architecture*. New Haven, CT: Yale University Press, 2003. Print.

Hegger, Manfred. *Construction Materials Manual*. Basel: Birkhäuser, 2006. Print.

Semper, Gottfried, Harry F. Mallgrave, and Michael Robinson. *Style in the Technical and Tectonic Arts, Or, Practical Aesthetics*. Los Angeles: Getty Research Institute, 2004. Print.

Pressman, Andy. *Architectural Graphic Standards*. Hoboken, N.J: John Wiley & Sons, 2007. Print.

Johnston, George B. *Drafting Culture: A Social History of Architectural Graphic Standards*. Cambridge, Mass: MIT Press, 2008. Print.

International Code Council. *The Florida Building Codes*. Current Edition. Online Resource. http://ecodes.biz/ecodes_support/Free_Resources/2010Florida/2010Florida_main.html

Hebel, Dirk. *Building from Waste: Recovered Materials in Architecture and Construction*. , 2014. Print. Also, ISSUU, http://issuu.com/birkhauser.ch/docs/building_from_waste/1

Knaack, Ulrich, Sharon Chung-Klatte, and Reinhard Hasselbach. *Prefabricated Systems: Principles of Construction*. Basel, Switzerland: Birkhauser, 2012. Print. Also, ISSUU, http://issuu.com/birkhauser.ch/docs/prefabricated_systems._principles_o/1

Boake, Terri M. *Diagrid Structures: Systems, Connections, Details*. , 2014. Print. Sample on ISSUU, <http://issuu.com/terriboake/docs/boake-diagrids/1>

Boake, Terri M, and Vincent Hui. *Understanding Steel Design: An Architectural Design Manual*. Basel, Switzerland: Birkhäuser, 2012. Print. Sample on ISSUU, <http://issuu.com/birkhauser.ch/docs/understanding-steel-design/1>

Detail Green: : Specialist Journal for Sustainable Planning and Construction. München: Inst. für Internationale Architektur-Dokumentation, serial 2009-.

Brownell, Blaine E. *Transmaterial: A Catalog of Materials That Redefine Our Physical Environment*. New York, N.Y: Princeton Architectural Press, 2010. Print. See also <http://transstudio.com>

Schittich, Christian. *Glas: Best of Detail = Glass*. München: Institut für internationale Architektur-Dokumentation, 2014. Print. Sample on ISSUU, http://issuu.com/detail-magazine/docs/bk_best_of_glas_d-e-2014_opt/1

Thomas Herzog, Roland Krippner, Werner Lang. *Facade Construction Manual*, Basel: Birkhauser Press, 2004.

Kind-Barkauskas, Friedbert. *Concrete Construction Manual*. Basel: Momenta, 2002. Print.

Pfeifer, Günter. *Masonry Construction Manual*. Basel: Birkhäuser, 2001. Print.

Charles Ramsey, Harold Sleeper, John Hoke. *Architectural Graphic Standards*, New York: Wiley, 2000.

Balkow, Dieter. *Glass Construction Manual*. Basel: Birkhäuser, 1999. Print.

Schulitz, Helmut C, Werner Sobek, and Karl J. Habermann. *Steel Construction Manual*. Basel: Birkhauser, 2000. Print.

Schunck, Eberhard. *Roof Construction Manual: Pitched Roofs*. Basel: Birkhäuser, 2003. Print.

Schittich, Christian. *Flat Roof Construction Manual: Materials, Design, Applications*. Basel: Birkhäuser, 2010. Print.

Bahamón, Alejandro, and Maria C. Sanjinés. *Rematerial: From Waste to Architecture*. New York: W.W. Norton & Co, 2010. Print.

Reference Books (you should have from previous courses)

Dennis J. Hall and Charles Rick Green. *The Architect's Guide to the U.S. National CAD Standard*. Hoboken, New Jersey: Wiley & Sons, Inc. 2006.

Frances D.K. Ching and Steven R. Winkel. *Building Codes Illustrated*, Current Edition. Hoboken, New Jersey: Wiley and Sons, Inc.

Edward Allen. *The Architect's Studio Companion*, Current edition, New York: Wiley Press.

Linda Brock. *Designing the Exterior Wall: An Architects Guide to the Vertical Envelope*, New York: Wiley Press, 2005.

Frances D.K. Ching. *Building Construction Illustrated* Current edition, New York: Wiley Press.

Additional References will be provided electronically.

Changes and Revisions to Syllabus may occur.

This syllabus is subject to change. Any changes will be relayed during regular class meetings.