

Kansas State University
College of Architecture, Planning and Design
Department of Architecture

BUILDING CONSTRUCTION SYSTEMS in ARCHITECTURE I
ARCH 433, Section A, Number 16740
Course Syllabus, Spring 2015

Location Seaton Hall, Room 63
Time 9:30 to 10:45 am, Tuesday/Thursday
Prerequisites ARCH 248, 348

Instructor Judy O'Buck Gordon, Assistant Professor
Registered Architect, LEED AP®
Contact judygordon@k-state.edu
Seaton Hall, Office 251B
Office Hours: 11:00am-12:00 pm, Tuesday and by appointment

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Contact shreedhara@ksu.edu
Meetings by appointment.



Steven Holl, Institute for Contemporary Art, Richmond, VA

Course Description

From the Course Catalog:

A lecture course that develops an understanding of how materials and systems assembly reinforce and extend the intentions of the designer as well as an understanding of the strategies and techniques for integration and coordination of the building components.

Course Philosophy:

My architectural interests lie at the juncture of poetics – the act of making and revealing with phenomenology and tectonics. For me “tectonics” represents the intent to build with beauty, meaning and usefulness, by joining site, program, form, ideas *with materials and details*. These “joinings” are the beginning of architectonic poetics. The interrogation of these junctures and systems constitute the basis of this course.

Course Content

A series of lectures will be presented elaborating on the following themes:

1. *Issues Common to all Projects*: Intention, Teams, Drawings, Zoning and Building Codes, ADA, Life Safety
2. *Groundwork*: Site Work
3. *Materials and Design Potential*: Wood, Masonry, Concrete, Steel, Glass: History, Properties, Composition, Wall Sections
4. *Matters of Scale*: Assemblies and Detailing. Small Scale:Residential / Medium:Civic / Large:Tall Buildings
5. *The Future is Now*: Integrated Assemblies; 3D Printing; "Found" Materials

Learning Outcomes

The intention is that the student will develop an understanding of materials and assemblies so that these systems are seen as a way to strategize the implementation of building components, which in turn strengthen the architectural intention. An emphasis will be placed on understanding:

- The history, composition, terminology, definitions and the unique properties of materials, in particular wood, masonry, concrete, glass and steel, and their use (how and why), manufacturing, sustainability considerations, and innovations/design potential.
- The architect's design intention relative to the project, the extended team, types of drawings (conventions of representation) required and project sequencing, as well as, rules and regulations (zoning, codes, ADA, life safety).
- The issues of scale small (residential), medium (civic) and large (towers) relative to materials, technologies and building systems from the foundation to roof, noting the assemblies of construction/fabrication through the study of architectural case studies.
- The student will develop an understanding of the particular materials, the manufacture, fabrication, and application of these materials and will be able to identify methods/systems through the understanding wall sections and details.

Projects

Group Project:Video

Teams of approximately **five students**, self-selected.

Presentations divided over two days.

The presentation will be a **three minute (max) video**.

These presentations must be succinct and concise. Clarity is of the essence.

Topics to be submitted and approved.

Brief will be issued.

Individual Project: Construction Report

You will document the activities of a construction site.

Brief will be issued.

Individual Project: Research Project

You will be designing/developing a wall/building section with roof.

The submission will consist of a final drawing and research.

You will have a clear design intention, backed up by research, and presented as a drafted, noted, final drawing.

Brief will be issued.

Note:

I reserve the right to revise the content this syllabus as necessary. Updated versions will be posted in course folder.

Grading

The final grade for the course will not be rounded up.

The final grade will be determined as follows:

Attendance	10% (See below for grading scale.)
Test #1	15%
Test #2	15%
<u>Quizzes (5)</u>	<u>15% NOTE: The two lowest grades of the five quizzes will be dropped.</u>
Group Project	10%
Construction Report	5%
Individual Project	15%
Final Exam (Test #3 +)	<u>15%</u>
	100%

As per K-State grading system:

- A--for excellent work
- B--for good work (above average)
- C--for fair (average) work
- D--for poor work
- F--for failure
- XF--for academic dishonesty
- P--for grades of B, C, and D on A/Pass/F courses
- Cr--for credit courses for which no letter grade is given (non-graded courses)
- NCr--for no credit in courses for which no letter grade is given (non-graded courses)
- NR--for no grade reported
- I--incomplete
- W--withdrawn

Class Attendance Grading Scale

Class attendance will be recorded.

You must sign the color coded sign-up sheets each class on the desk at the rear of Seaton 63 to be counted as present.

If a class must be missed it must be an approved University excuse, as per the Dean's Office Student Services, Seaton 213. See below. Please submit the excuse in writing with appropriate back-up to the Teaching Assistant.

Grades for class attendance:

- 100: No absences
- 95: 1 absence
- 90: 2 absences
- 85: 3 absences
- 80: 4 absences
- 50: 5 absences
- 40: 6 absences
- 30: More than 6 absences (7 and beyond)

Absence clarification from the Dean's Office Student Services, Seaton 213:

An **official absence notification** will be issued for the following reasons (verified documentation will be required if an examination, quiz, project or some form of assessment took place during the absence) if requested by the student:

- ✓ Illness or injury (requiring absence from 2 or more class sessions)
- ✓ Personal or family emergency
- ✓ Severe weather delaying return to campus
- ✓ Funeral of a family member or friend
- ✓ Court appearance

The following are **NOT** considered to be official absences, so an official notification will **not** be issued by the Dean's Office:

- Illness or injury requiring absence from one class session
- Participation in family activities
- Non-emergency/ routine doctor or dental appointments
- Participation in field trips, conferences, meeting or other similar activities
- Participation in non-varsity athletic activities

Students with an unofficial absence are expected to immediately notify the faculty of the absence. The faculty member will then determine whether the absence will be excused or unexcused.

Required Information

1. Students with requiring special needs are required to contact the [Office of Affirmative Action \(affact@k-state.edu\)](mailto:affact@k-state.edu) to ensure appropriate arrangements.
2. Cellphones are to be silenced during class.
3. Please complete the course opinion survey at the end of the semester.
4. **Students with Disabilities**
Students with disabilities who need classroom accommodations, access to technology, or information about emergency building/campus evacuation processes should contact the Student Access Center and/or their instructor. Services are available to students with a wide range of disabilities including, but not limited to, physical disabilities, medical conditions, learning disabilities, attention deficit disorder, depression, and anxiety. If you are a student enrolled in campus/online courses through the Manhattan or Olathe campuses, contact the [Student Access Center at accesscenter@k-state.edu](mailto:accesscenter@k-state.edu), 785-532-6441; for Salina campus, contact the [Academic and Career Advising Center at acac@k-state.edu](mailto:acac@k-state.edu), 785-826-2649.
5. **Campus Safety Statement**
Kansas State University is committed to providing a safe teaching and learning environment for student and faculty members. In order to enhance your safety in the unlikely case of a campus emergency make sure that you know where and how to quickly exit your classroom and how to follow any emergency directives. To view additional campus emergency information go to the University's main page, www.k-state.edu, and click on the Emergency Information button.
If you observe, or suspect, criminal activity call the University Police Department at (785) 532-6412. Do not confront the subject. For all other emergencies, please become familiar with the University's emergency protocols. (<http://www.k-state.edu/safety/emergency/>). For life threatening emergencies, please dial 911.
6. **Academic Honesty**
Kansas State University has an Honor System based on personal integrity, which is presumed to be sufficient assurance that, in academic matters, one's work is performed honestly and without unauthorized assistance. Undergraduate and graduate students, by registration, acknowledge the jurisdiction of the Honor System. The policies and procedures of the Honor System apply to all full and part-time students enrolled in undergraduate and graduate courses on-campus, off-campus, and via distance learning. The honor system website can be reached via the following URL: www.k-state.edu/honor. A component vital to the Honor System is the inclusion of the Honor Pledge which applies to all assignments, examinations, or other course work undertaken by students. The Honor Pledge is implied, whether or not it is stated: "On my honor, as a student, I have neither given nor received unauthorized aid on this academic work." A grade of XF can result from a breach of academic honesty. The F indicates failure in the course; the X indicates the reason is an Honor Pledge violation.
The expectation is that all are to be aware and honor the following University policies:
http://catalog.k-state.edu/content.php?catoid=13&navoid=1412#stud_cond
[Student Conduct](#)
[Honor System](#)
[Plagiarism](#)
[Other Forms of Academic Cheating](#)
[University Policies](#)
7. **Expectations for Classroom Conduct**
All student activities in the University, including this course, are governed by the [Student Judicial Conduct Code](#) as outlined in the Student Governing Association [By Laws](#), Article V, Section 3, number 2. Students who engage in behavior that disrupts the learning environment may be asked to leave the class.
8. **Copyright Notification**
© Copyright 2015 Judy O'Buck Gordon as to this syllabus and all lectures. During this course students are prohibited from selling notes to or being paid for taking notes by any person or commercial firm without the express written permission of the professor teaching this course.
9. **Academic Freedom Statement**
Kansas State University is a community of students, faculty, and staff who work together to discover new knowledge, create new ideas, and share the results of their scholarly inquiry with the wider public. Although new ideas or research results may be controversial or challenge established views, the health and growth of any society requires frank intellectual exchange. Academic freedom protects this type of free exchange and is thus essential to any university's mission.
Moreover, academic freedom supports collaborative work in the pursuit of truth and the dissemination of knowledge in an environment of inquiry, respectful debate, and professionalism. Academic freedom is not limited to the classroom or to scientific and scholarly research, but extends to the life of the university as well as to larger social and political questions. It is the right and responsibility of the university community to engage with such issues.
10. **Intellectual Property**
Student creations are subject to the Kansas State University and Board of Regents (BOR) Intellectual Property Policies. The BOR Policy states:
"The ownership of student works submitted in fulfillment of academic requirements shall be with the creator(s). The student, by enrolling in the institution, gives the institution a non-exclusive royalty free license to mark on, modify, retain the work as may be required by the process of instructions, or otherwise handle the work as set out in the institution's Intellectual Property Policy or in the course syllabus. The institution shall have the right to use the work in any other manner without the written consent of the creator(s)."
"Otherwise handles." As referred in the BOR Intellectual Property Policy, includes display of student in various media and for use in accreditation purposes. The Kansas State University Intellectual Property Policy can be found at:
<http://www.k-state.edu/policies/ppm/7000/7095.html>

Texts

Required Text

**The Architecture Reference & Specification Book:
Everything Architects Need to Know Every Day**
New York: Rockport Publishers, 2013, Wheeler, Dan; McMorrough, Julia.

Required Readings

Materials for Design 2

New York: Princeton Architectural Press, 2006, Bell, Victoria Ballard.
(Readings posted in course folder. Book will be on reserve in the Weigel Library / Two Hour Closed Reserve as a reference for the final project.)

Pre-requisite Texts (Not required to purchase)

Fundamentals of Building Construction: Materials and Methods,
John Wiley & Sons, NY, 2009, Allen, Edward and Iano, Joseph.

Building Construction Illustrated

New York, New York: Van Nostrand Reinhold, 1991, Ching, Frank.

Reference: On Reserve in the Weigel Library / Two Hour Closed Reserve

Alread, Jason; Leslie, Thomas. **Design-Tech Building Science for Architects**, Oxford, UK Burlington, MA: Architectural Press/Elsevier, 2007, NA2750.A5585 2007

Deplazes, Andrea. **Constructing Architecture**, Birkhäuser Architecture; 2nd ed. 2008.

Yu, Mayine L. **Skins, Envelopes and Enclosures**, New York, NY: Routledge, 2014, NA2940 .Y8 2014

Research Texts On Reserve in the Weigel Library / Two Hour Closed Reserve

Ford, Edward. **The Details of Modern Architecture**, Cambridge, MA: MIT Press, 1990

Ibid. **The Details of Modern Architecture: Volume II**, Cambridge, MA: MIT Press, 1994

Frampton, Kenneth. **Studies in Tectonic Culture**, Cambridge, MA: MIT Press, 1995, NA642 .F72 1995

McLeod, Virginia. **Encyclopedia of Detail in Contemporary Residential Architecture**, London: Laurence King, 2010, NA7126 .M38 2010

Ibid. **Encyclopedia of Detail in Contemporary Timber Architecture**, London: Laurence King Publishing, 2010, NA4110 .M354 2010

Ibid. **Details in Contemporary Glass Architecture**, London: Laurence King Publishing, 2011, NA4140 .M35 2011

McMorrough, Julia. **Materials Structures Standards**, Gloucester, MA: Rockport Publishers, 2006, NA2540 .M43 2006

Wigginton, Michael. **Glass in Architecture**, London: Phaidon, 1996, NA4140 .W54 1996

"In Detail" series of Birkhauser publications, edited by Christian Schittich

Detail Magazine (German/English)

Detail Green (German/English)

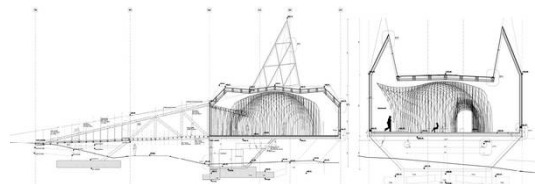
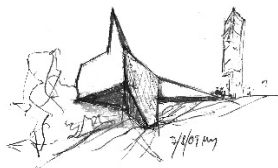
<http://www.detail-online.com/>

Suggested Texts

Iwamoto, Lisa. **Digital Fabrications**, New York: Princeton Architectural Press, 2009, NA2728 .I93 2009

Kolarevic, Branko. **Architecture in the Digital Age: Design and Manufacturing**, New York, NY: Spon Press, 2003, NA2543.T43 A724 2003

Additional readings may be announced in class and will be posted to the course folder.



Course Outline BCSA1

Spring 2015

January

Week 1

- Tu20 **Introduction**
Course Logistics
Overview and Introduction
Tectonics/"Joinings"
- Th22 **L1 The Architect's Design Intentions**

Week 2

- Tu27 **L2 The Architect and the Team**
The Role of the Architect
The Client
The Consultants
The Contractor and Sub-Contractors
- Th30 **L3 Types of Drawings: Reading / Coordinating / Understanding**
Architects and Consultants Drawings
Cost Estimating
Specifications / MasterFormat
Methods of Construction Delivery

February

Week 3

- Tu3 **L4 *Making the Modern* / Tadao Ando**
Team roles in action
CONSTRUCTION REPORT Issued
Due in 5 weeks: March 5th
- Th5 **L5 Rules and Regulations 1**
City and State Codes of Ordinances
Zoning
Building Codes for Architects and Engineers

Week 4

- T10 **L6 Rules and Regulations 2**
Life Safety: NFPA 101(National Fire Protection Association)
ADA (Americans with Disability Act)
Universal Design

Th12 **TEST 1**

Week 5

- Tu17 **L7 SITE WORK: GROUNDING**
Overview of types of foundation
Types of Loads
Soil Types
Settlement
Types of Foundations
Types of Footings
GROUP PROJECT VIDEO Issued
Due in 8 weeks: April 16th
- Th19 **L8 SITE WORK: CONSTRUCTION**
Materials and Design
Use (How and Why)
Drawing Conventions
Retaining Walls

Week 6

Tu24 L9 WOOD
History
Composition
Unique Properties
Materials and Design Potential
Use (How and Why)
Sustainability Considerations
Innovations / Potential
Reading: *Wood, Materials for Design 2*, pp.85-92. (In course folder.)

Th26 L10 WOOD FRAMING
Quiz 1
Wood
Reading
History
Composition
Unique Properties
Materials and Design Potential
Use (How and Why)
Sustainability Considerations
Innovations / Potential

March

Week 7 Tu3 L11 Wood Case Studies
Illustrating the assemblies of construction and processes: *wall sections, axonometric drawings, videos*
Emphasizing the particular material: *Its particularities and desired conditions*
Foundation to Roof: *Assemblies of construction from the earth to the sky*

Th5 L12 GLASS
History
Composition
Unique Properties
Materials and Design Potential
Use (How and Why)
Sustainability Considerations
Innovations / Potential
Reading: *Glass, Materials for Design 2*, pp.11-15. (In course folder.)
CONSTRUCTION REPORT DUE/ Digital and Hard Copy
Digital copy in Course Folder by 5pm
Hard Copy in class by 10:45am

Week 8

Tu10 L13 Glass Case Studies
Quiz 2
Glass
Illustrating the assemblies of construction and processes: *wall sections, axonometric drawings*
Emphasizing the particular material: *Its particularities and desired conditions*
Foundation to Roof: *Assemblies of construction from the earth to the sky*

Th12 IAPD Focus Lecture
ARCH ADS2 Dallas Study Trip: Architecture students attending/excused

SPRING BREAK March 16 - 20

Week 9

Tu24 **Guest Lecture:** Professor Matt Knox, Department Head of Architecture "Making a Movie"
Film: Nelson Atkins Museum / Steven Holl - Exemplary film illustrating points of movie making and construction of museum
ARCH ADS4 NYC Study Trip: Professor Gordon attending/excused

Th26 **TEST 2**
ARCH ADS4 NYC Study Trip: Professor Gordon attending/excused

Week 10

Tu31 L14 MASONRY Small Units
History
Composition
Unique Properties
Materials and Design Potential
Use (How and Why)
Sustainability Considerations
Innovations / Potential

INDIVIDUAL RESEARCH PROJECT Issued

Due in 5 weeks: May 6th

APRIL Th2 MASONRY DEMONSTRATION in Seaton courtyard by Kansas Masonry Industries Council (KMIC)

Week 11

Tu7 L15 MASONRY Large Units
History
Composition
Unique Properties
Materials and Design Potential
Use (How and Why)
Sustainability Considerations
Innovations / Potential

Reading: *Masonry, Materials for Design 2*, pp 217-223. (In course folder)

Th9 L16 Masonry Case Studies

Quiz 3 Illustrating the assemblies of construction and processes: *wall sections, axonometric drawings, videos*

Masonry Emphasizing the particular material: *Its particularities and desired conditions*

Reading Foundation to Roof: *Assemblies of construction from the earth to the sky*

Week 12

Tu14 L17 CONCRETE
History
Composition
Unique Properties
Materials and Design Potential
Use (How and Why)
Sustainability Considerations
Innovations / Potential

Reading: *Concrete, Materials for Design 2*, pp 49-55. (In course folder and library)

Th16 L18 Concrete Case Studies

Quiz 4 Illustrating the assemblies of construction and processes: *wall sections, axonometric drawings videos*

Concrete Emphasizing the particular material: *Its particularities and desired conditions*

Reading Foundation to Roof: *Assemblies of construction from the earth to the sky*

GROUP VIDEOS are DUE today, so that you have time to study for the Structures exam

Week 13

Tu21 **GROUP VIDEO PRESENTATIONS**

Th23 **GROUP VIDEO PRESENTATIONS**

Week 14

Tu28 L19 STEEL
History
Composition
Unique Properties
Materials and Design Potential
Use (How and Why)
Sustainability Considerations
Innovations / Potential

Reading: *Metal, Materials for Design 2*, pp 129-141. (In course folder)

Th30 L20 Steel Case Studies
Quiz 5 Film: *Living Organisms: Four Buildings* by Nicholas Grimshaw - Case Study British Pavilion
Metal Illustrating the assemblies of construction and processes: *wall sections, axonometric drawing, videos*
Reading Emphasizing the particular material: *Its particularities and desired conditions*
Foundation to Roof: *Assemblies of construction from the earth to the sky with emphasis on detailing and intention*

Week 15 (Studio Review Week)

MAY

Tu5 L21 Large Scale Buildings: Towers
Case studies
Illustrating the assemblies of construction and processes: *wall sections, axonometric drawings, videos*
Emphasizing the particular material: *Its particularities and desired conditions*
Foundation to Roof: *Assemblies of construction from the earth to the sky*

Th7 L 22 Innovation: The Future is Now
EFTE Panels
Water Cube
Plastics Reading: *Materials for Design 2*, pp.175-180. (In course folde)
Integrated Assemblies
Kieran Timberlake
3D Printing
Soil Stone Spray: using soil on-site
Housing - Contour Crafting, University of Southern California, Professor Behrokh Khoshnevis
"Grasshopper"
Barcelona Project
"Found" Materials / Assemblies
Shipping Containers
Rural Studio

SUBMISSION of INDIVIDUAL PROJECTS
Digital Copy posted to Course Folder by 6pm
Hard Copy submitted between 3pm-5pm, Room 251B

Final Exam Week: May 11-15

M 11 **The FINAL EXAM is on MONDAY**
May 11
2:00 to 3:50pm

Enjoy the Summer Break!