Pratt Institute School of Architecture
Graduate Architecture Program
Course Syllabus

	Arch 762	Materials And Assemblies
Fall 2016		

Credits: **3**
Type of Course: **Lecture (Required)**
Class Meetings: **Friday**
Prerequisites: **ARCH 630**
Enrollment Capacity:
Section / Instructor: **01 / Gabrielle Brainard, gbrain64@pratt.edu**
02 / Stephen Chu, schu@ennead.com
03 / Frank Lupo, flupo@pratt.edu
04 / Ben Martinson, bmartins@pratt.edu
05 / Gabrielle Brainard, gbrain64@pratt.edu
Teaching Assistants: **Emma Jung, yjung9@pratt.edu**
Maxwell Smith, msmith21@pratt.edu
TA Office Hours: **02:00 PM – 4:00 PM, Wednesdays (Max)**
12:00 PM – 2:00 PM, Fridays (Emma)
Time and Location: **02:00 PM - 4:50 PM, Friday, HHS 111**

Course Overview:
Topics include assemblage of the structural types: wood, masonry, steel, tensile structures, and concrete; selection criteria for non-structural materials: glass, plastics, and non-ferrous materials; building components: stairs, windows, glass, and interior finishes, and criteria for fire, water movement, sound, and temperature control.

Prerequisites:
ARCH-630. Sections of this course are reserved for graduate level students. May not be repeated.

Learning Objectives:
Primary learning objectives include an understanding of the fundamental systems (environmental, structural, building envelope, etc.) of building construction. Students will learn how to research and specify materials and systems for Architectural use, paying close attention to issues such as design, environmental responsibility, life safety, and constructability. Students will also be introduced to construction detailing as a critical component of Architectural practice.

This course meets the following NAAB student performance criteria:
In Realm B: Building Practices, Technical Skills, and Knowledge: Graduates from NAAB-accredited programs must be able to comprehend the technical aspects of design, systems, and materials and be able to apply that comprehension to architectural solutions. In addition, the impact of such decisions on the environment must be well considered. Student learning aspirations for this realm include creating building designs with well-integrated systems, comprehending constructability, integrating the principles of environmental stewardship, and conveying technical information accurately.

B.4 Technical Documentation: *Ability* to make technically clear drawings, prepare outline specifications, and construct models illustrating and identifying the assembly of materials, systems, and components appropriate for a building design.

B.7 Building Envelope Systems and Assemblies: *Understanding* of the basic principles involved in the appropriate selection and application of building envelope systems relative to fundamental performance, aesthetics, moisture transfer, durability, and energy and material resources.

B.8 Building Materials and Assemblies: *Understanding* of the basic principles used in the appropriate selection of interior and exterior construction materials, finishes, products, components, and assemblies based on their inherent performance, including environmental impact and reuse.
Students and faculty should consult the NAAB website www.naab.org for additional information regarding student performance criteria and all other conditions for accreditation.

Course Requirements:

- Attend all class meetings and reviews. Students with more than three absences will fail the course. Students will receive a warning letter, copied to the Chair's Office, after their first two absences.

- Be on time. Classes and reviews will start promptly at the scheduled time. Attendance will be taken at the beginning of class.

- Read the assigned sections of the Text and Course Handouts.

- Complete all assignments on time. Instructions for turning in assignments vary, and will be included with the assignment handouts. Late work will receive a reduced grade.

Weekly Quizzes:

Each class will begin with a short, multiple choice quiz that will also confirm your attendance. The quiz will start at 2:00 PM and will be administered online. Each week, you must bring a device that can connect to the internet (phone, laptop, tablet, etc) to take the quiz. Speak to the instructors or TAs if you need help finding a device to use for class.

Weekly Exercises:

Each week, we will assign a construction detailing exercise related to the lecture. The exercises will increase in complexity over the course of the semester. The intention is to help students build a repertoire of detailing skills. The homework will be due the night before class, and the solutions will be reviewed in class.

Methods of Assessment:

- Weekly Quizzes (8 total):	30% (3.75% each)
- Weekly Exercises (8 total):	30% (3.75% each)
- Final Project and Presentation:	40%

Grades:
The students at the Graduate Architecture and Urban Design Program are required to maintain an overall 3.0 [B] grade point average.

A = Excellent: Student completes all the material in a timely fashion with rigor, insight, and interest.
B = Good: Student completes all the material in a timely fashion in a satisfactory manner.
C = Fair: Student satisfies the general demands of the course.
D = Unsatisfactory: student is unable to meet the basic requirements of the course in terms of attendance, discussion, preparedness, or completion of work.
F = Unacceptable: Student is unable to meet the minimal requirements of the course and exhibits poor performance.

BIBLIOGRAPHY:

Required Texts:

Allen, Edward, Fundamentals of Building Construction, Materials and Methods, Sixth Edition, New York: John Wiley & Sons, Inc., 2013.

Ching, Francis and Cassandra Adams, Building Construction Illustrated, Fifth Edition, New York: John Wiley & Sons, Inc., 2014.

These books can be ordered from Pratt's online bookstore: http://www.pratt.bkstr.com

Recommended Resources:

Allen, Edward, Architectural Detailing: Function, Constructability, Aesthetics, Second Edition, New York: John Wiley & Sons, Inc., 2007.

Ballast, David, Architect's Handbook of Construction Detailing, Second Editions, New York: John Wiley & Sons, Inc., 2009.

Deplazes, Andrea, Constructing Architecture: Materials, Processes, Structures, Basel: Birkhauser, 2005.

Hegger, Manfred, Volker Auch-Schwelk, Matthias Fuchs, and Thorsten Rosenkranz, Construction Materials Manual, Basel: Birkhaüser, Edition Detail, 2006.

Herzog, Thomas, Krippner, Roland, and Lang, Werner, Façade Construction Manual, Basel: Birkhauser, Edition Detail, 2008.

Patterson, Mic, Structural Glass Facades and Enclosures, New York: John Wiley & Sons, Inc., 2011.

Ramsey, Charles and Sleeper, Harold; Holke, John Ray, Jr., AIA, ed., Architectural Graphic Standards, Tenth Edition, New York: John Wiley & Sons, Inc., 2000.

Schittich, Christian, In Detail Building Skins, Basel: Birkhauser, 2001.

Watts, Andrew. Modern Construction Envelopes, Wien: SpringerVerlag, 2011.

Online Resources:

Starting this year, the Pratt Libraries have subscribed to DETAIL Inspiration, the online portal for DETAIL Magazine.

On-campus access is via the Libraries' "Articles and Databases" page:
https://library.pratt.edu/find_resources/articles_databases/

Off-campus access is via the same link. Enter your One-Key credentials when prompted.

Supplementary Texts:

Ford, Edward, The Architectural Detail, Princeton Architectural Press, 2011.

Ford, Edward, Details of Modern Architecture, Volumes 1 and 2, Cambridge: MIT Press, 2003.

Frampton, Kenneth, Studies in Tectonic Culture, Cambridge: MIT Press, 1996.

FALL 2016 SEMESTER SCHEDULE:

Week 01	**Friday 26 August**	Introduction (GB, FL, SC, BM) Quiz demonstration *in-class* Exercise demonstration *in-class*
Week 02	**Friday 2 September**	Natural Materials (SC) Quiz *in-class (test-run)* Exercise 1 *assigned*
Week 03	**Friday 9 September**	Engineered Materials (GB) Quiz 1 *in-class* Exercise 1 *reviewed* Exercise 2 *assigned*
Week 04	**Friday 16 September**	Synthetics and Composites (BM) Quiz 2 *in-class* Exercise 2 *reviewed* Exercise 3 *assigned*
Week 05	**Friday 23 September**	Building Structural Systems & Assemblies (SC) Quiz 3 *in-class* Exercise 3 *reviewed* Exercise 4 *assigned*
Week 06	**Friday 30 September**	Building Envelope (GB) Quiz 4 *in-class* Exercise 4 *reviewed* Exercise 5 *assigned*
Week 07	**Friday 7 October**	Construction Documents and Specifications (FL) Quiz 5 *in-class* Exercise 5 *reviewed* Exercise 6 *assigned*
Week 08	**Friday 14 October**	Performance Criteria for Architectural Assemblies (SC) Quiz 6 *in-class* Exercise 6 *reviewed* Exercise 7 *assigned* Final Project *assigned*
	Saturday 15 & Sunday 16 October	**OPEN HOUSE NEW YORK WEEKEND** www.ohny.org
Week 09	**Friday 21 October**	Environmental Criteria and Sustainable Design (GB) Quiz 7 *in-class* Exercise 7 *reviewed* Exercise 8 *assigned*
Week 10	**Friday 28 October**	Case Study Building (SC) Quiz 8 *in-class* Exercise 8 *reviewed*
Week 11	**Friday 4 November**	Field Trip TBD
Week 12	**Friday 11 November**	Final Project Individual Crits *Desk crits – meet in studio*

Week 13	**Friday 18 November**	Final Project Individual Crits *Desk crits – meet in studio*
Week 14:	**Friday 25 November**	**THANKSGIVING: NO CLASS**
Week 15:	**Friday 2 December**	Final Project Individual Crits *Desk crits – meet in studio* *Course Evaluations*
Week 16:	**Friday 9 December**	**FINAL STUDIO REVIEWS: NO CLASS**
Week 17:	**Friday 16 December**	**Final Project Review**
	Tuesday 20 December	Grades Due

LECTURES:

All required readings from Allen, Fundamentals of Building Construction, Materials and Methods.

Week 01: Introduction
Introduction to the class and syllabus.
Supplementary reading: Frampton, Studies in Tectonic Culture, Introduction.

Week 02: Natural Materials
Introduction to materials found naturally in the environment and implemented into building assemblies with minimal processing, such as: wood, stone, earth, and metal ores.
Required reading: *Ch. 3, "Wood"*
Ch. 8, "Brick Masonry"
Ch. 9, "Stone and Concrete Masonry"

Week 03: Engineered Materials
Introduction to engineered materials in building assemblies, such as: steel, concrete, and glass.
Required reading: *Ch. 11, "Steel Frame Construction"*
Ch. 13, "Concrete Construction"
Ch. 14, "Sitecast Concrete Framing Systems"
Ch. 15, "Precast Concrete Framing Systems"
Ch. 17, "Glass and Glazing

Week 04: Synthetic Materials and Composites
Introduction to synthetic materials in building assemblies such as polymers, sealants, coatings and finishes, as well as natural and engineered materials fabricated together with synthetics.
Required reading: *T.B.D.*

Week 05: Building Structural Systems
Overview of building structural systems such as post and lintel, the arch, the dome, the steel frame, reinforced concrete, and tensile structures. Introduction to foundations, wall construction and roof construction.
Required reading: Ch. 2, "Foundations and Sitework"
Ch. 4, "Heavy Timber Frame Construction"
Ch. 5, "Wood Light Frame Construction"
Ch. 10, "Masonry Wall Construction"
Ch. 12, "Light Gage Steel Frame Construction"
Ch. 16, "Roofing"

Week 06: Building Enclosure Systems
Introduction to design of the building envelope: reconciling performance criteria such as watertightness and thermal performance with the pursuit of specific architectural and aesthetic effects such as lightness, transparency, and tectonic expression. Discussion of interior assemblies as they relate to the building enclosure, including ceilings, floors, lighting, and mechanical systems.
Required reading: Ch. 6, "Exterior Finishes for Wood Light Frame Construction"
Ch. 18, "Windows and Doors"
Ch. 19, "Designing Exterior Wall Systems"
Ch. 20, "Cladding with Masonry and Concrete"
Ch. 21, "Cladding with Metal and Glass
Ch. 7, "Interior Finishes for Wood Light Frame Construction"
Ch. 22, "Selecting Interior Finishes"
Ch. 23, "Interior Walls and Partitions"
Ch. 24, "Finish Ceilings and Floors"

Week 07: Building Performance Criteria

Introduction to building performance criteria, such as: human comfort, acoustics, life safety, water and air tightness, and building longevity and maintenance. Introduction to legal constraints, such as zoning and building code requirements.

Required reading: Ch. 1, “Making Buildings”

Week 08: Environmental Performance Criteria and Sustainable Design

Introduction to environmental criteria, such as: climate, daylighting, rain, snow, and wind, as well as a discussion of energy consumption by and in buildings and construction and sustainable design methods.

Required reading: T.B.D.

Week 09: Construction Documents and Specifications

Introduction to typical and atypical approaches to detailing, architectural Construction Document organization including the importance of fabrication and installation. Introduction to the project manual including construction documents, specifications, and project delivery methods. Discussion of specification of exterior wall systems, with regard to performance, materiality, and assembly type.

Required reading: T.B.D.

Week 10: Case Study Building

Case study of a building, or buildings, from initial schematic design through construction, including interface with client, governmental agencies, consultants, and construction team.

Required reading: T.B.D.

Weeks 11 - 16: Individual Crits of Final Project