

COLUMBIA GRADUATE SCHOOL OF ARCHITECTURE PLANNING AND PRESERVATION

COURSE SYLLABUS:

A4115 INTEGRATED DESIGN: URBAN SCALE SPRING 2017

1 CLASS DESCRIPTION AND OBJECTIVES

Integration is about problem solving collaboratively across disciplines. True collaboration requires a base level of knowledge of disciplines other than one's own in order to ask the right questions, to be open-minded to the answers, and to have the design dexterity to translate answers into built form. Architects, engineers, planners, developers, communities, and government agencies attempt to collaborate every day. Some find ingenious ways to shape cities through architectural insertions. Others just seem to fight against each other despite seemingly having the same underlying goals on what makes better cities.

Urban-scale systems can, and should, shape building form and function as much as building-scale systems. Buildings are influenced by, the flow of people, goods, water, energy, money, culture, and ideas all around them. These influences are becoming more pronounced for today's architect as architecture drives increasingly drives solutions to urban scale issues such as climate change, social inequality, public health and wellness.

This class is the second half of your experience developing proficiency with integrated design at Columbia. This time you will be dealing with systems you do not control. Urban-scale systems extend through the regional watershed, the local sewer shed, the city's electrical grid, highway networks, food systems, micro and macro-economic systems, and waste management networks. Buildings may plug into these systems, or these systems may plug into a building. Either way a building doesn't work without effectively connecting to and supporting these and many other urban scale systems. Integration at building scale is formalized and structured. Integration at urban scale is less defined.

A4115 Integrated Design: Urban Scale will follow a similar approach to A4114, but will begin by zooming out to study technical systems that operate outside the walls and the site of a building. Beginning at the city and regional scale we will consider the processes building users will undertake to move around the city and into the site. We will ask: can the design of a building influence how people move around a city? We will understand how the flows of water along the ground, from the sky, and even underground may impact building design. Where does electricity, natural gas, solar insolation, wind energy, and gasoline come from and what impacts do the

Newtown Creek Wastewater Treatment Plant, *Ennead*



consumption of these energies have on the world at-large. What happens to trash after it leaves the loading dock? What is the path your food follows before it ends up on your plate?

Rebuild By Design, The BIG U, *Bjarke Ingals Group*

By progressively studying urban systems at an increasingly granular scale starting with the entire city, moving down to the neighborhood, site, and immediate building perimeter, a full understanding of the interplay between a building and multiple urban system will be developed. The first few weeks of the semester will constitute a rigorous urban systems analysis stage that will be used to form the basis of conceptual building design in the second half of the class. Based on the analysis and understanding of various urban systems each team will ask and answer: What should this building be? Who should it serve? How will they get there? What is the development program? How can this building make a difference in the community? How can this building improve water and air quality? Where do water, power, gas, food, and other utilities come from? Where does stormwater, sanitary water, trash, and other waste products go when they leave the site?



The course will start with key ideas about integration at the city scale. What drives the first decisions to be made on a project? Where do the first technical constraints appear in massing, egress, structure, mechanical systems? We will explore through early lectures and assignments some fundamental ways of looking at the basic drivers for decision making and use of tools and support information to assist you in developing your future projects, including the project for this class. Through the process of understanding the macro issues surrounding the planning of a building, the functions of the building design and site planning will be better served. What techniques lead to rapid iteration around design ideas and strategies?

The design project for the class is a concept design for a building. The final deliverable for the class is a Concept Plan Book that tells the story of the building and the framework of urban systems that were used to generate and support the design.

2 CLASS HOURS

Class time: Tuesday 2-6 pm

Lectures: Tuesday 2-3 pm. Avery 113.

- Workshops:** Tuesday 3-6 pm. Avery 114, 115, 300. Rooms will be assigned based on teams.
- Reviews:** Tuesday 2-6 pm. Rooms will be assigned.
NOTE: On the days when reviews are held, there will be no lecture. Reviews will begin at 2pm. Students must be pinned up by 2pm sharp in review rooms. All students must be present for the full review from 2-6pm.
- Site Visits:** Fridays 9-11am. Site visits will be arranged to be outside of regular class time. 2 site visits are organized for the class and are indicated on the syllabus, including the site visit for the project brief.
- Office Hours:** By Appointment with professors or other critics – generally 6-7pm Tuesday evenings.

3 CLASS INSTRUCTORS AND CRITICS

Professor Craig Schwitter craig.schwitter@burohappold.com

Teaching Assistant Wen Zhou wz2307@columbia.edu

Critics Instructors and critics are experts in their respected professional fields and are invited on a regular basis to review and develop student projects for the semester. Lead Instructors will be present for all workshop sessions. Specialist critics in Energy, Water and Mobility will be introduced at several focused times in the semester to enable deeper integration of these systems into student projects. Review critics will attend the 3 pinup reviews and help students with overall project direction, strategy and integration.

Group 1	Lead Instructor Energy Critic Water/Civil Critic Mobility Critic	Earl Jackson Anna Oursler Theodoros Barbagianis Trent Lethco	Earl Jackson Workshop Beyer Blinder Belle E Design Dynamics Arup
Group 2	Lead Instructor Energy Critic Water/Civil Critic Mobility Critic	Craig Schwitter Erik Olsen April Schneider Matthew Carmody	Buro Happold Transsolar Level Infrastructure AKRF
Group 3	Lead Instructor Energy Critic Water/Civil Critic Mobility Critic	Philip Palmgren TBD Adam Friedburg Zabe Bent	RePlace Urban Studio TBD Buro Happold Nelson Nygaard
Review Critics		Byron Stigge Michelle Delk Dana Getman Sean Gallagher	Level Infrastructure Snohetta SHOP DSR

Guest Lecturers

Guest lecturers will be invited to the class for lectures addressing specific and specialist areas of interest to students in the development of their projects.

Critic Review Schedule

A4115 AT5 Integrated Design : Urban Scale		WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10	WEEK 11	WEEK 12	WEEK 13	WEEK 14	WEEK 15	WEEK 16
	LECTURE	INTRO SITE	MOBILITY 1 WATER 1	ENERGY 1 WASTE	WATER 2	CONNECTIVITY	SITE STRATEGY	MIDTERM REVIEWS	ECOLOGY	SPRING BREAK	MOBILITY 2	ENERGY 2	BLDG STRATEGY	ECONOMICS	OPEN	STUDIO FINAL REVIEWS	
	WORKSHOP		WORKSHOP 1	WORKSHOP 2	WORKSHOP 3	WORKSHOP 4	PIN UP	NO CLASS	WORKSHOP 5	NO CLASS	WORKSHOP 6	WORKSHOP 7	PIN UP	WORKSHOP 8	WORKSHOP 9	NO CLASS	FINAL REVIEW
Lead Instructors		1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/7	3/14	3/21	3/28	4/4	4/11	4/18	4/25	5/4
Mobility Critics			•	•			•		•		•	•		•			•
Energy Critics				•	•						•	•					
Water/Civil Critics				•	•							•					
Review Critics							•	•					•				•
Guest Lecture						•	•		•				•				•
Guest Lecture																	
Guest Lecture																	

ENERGY/WATER/MOBILITY FOCUS
 ALL GROUP PIN UPS
 NO CLASS

4 CLASS REQUIREMENTS

a. Lectures

Weekly lectures will introduce key concepts and principles to be applied in the workshops. The lectures will introduce concepts for urban scale systems including energy, water and mobility elements of planning and design appropriate to architectural strategy development. Case studies will be reviewed to introduce broader integration examples in built form. Specialist guest lecturers will be introduced for additional key topics that are driving architectural strategy at urban scale.

b. Site Visits

Exposure to large scale sites influenced by broader urban systems is an important part of developing your skills as an architect. This class requires a site visits for projects currently under the planning and construction stages in the New York City region. This site visits will explore current class discussion areas and be an opportunity to share best (and not so best) planning and design practices in the field today.

Site visits will be hosted outside of class hours. Students will need to make accommodations to ensure they can attend the site visits. Attendance is mandatory and site visit reports will be required as part of the studio work. NOTE: STUDENTS MUST WEAR APPROPRIATE CLOTHING TO SITE VISITS. Thick soled shoes, long sleeved shirts, no shorts or skirts. Without appropriate attire, you will not be allowed into site or site offices.

c. Class Project

The focus of the class is a semester long workshop project that will require development and understanding around how urban systems interact and ultimately shape architecture. The project brief will be a research campus located at a site in New York City, which is detailed in a separate document to this syllabus.

Students will work in 4 person teams for the semester. Teams will be developed in the first week of class and before the introduction of the lead instructors in Week 2. Teams should consist of no more than 2 teammates from previous AT4 teams. Teams should be chosen for balance with an understanding of how teammates can contribute to the whole of the team. Teams will have to develop a name and provide bios for the lead instructors in Week 2.

Each team will develop a detailed site and building strategy approach as well as corresponding series of drawings for all systems. The first part of the semester will be dedicated to developing a broad site strategy and program with input from lead instructors and key specialist critics. The second part of the semester will focus on a building strategy, either in part or whole, that will explore the relationship between the broader urban systems shaping the project and the integration of the architectural scale product.

Lead instructors will be present at each workshop session to ensure consistent guidance and input into the project development. Key specialist critics in mobility, energy and water/civil systems will be invited at selected times to the workshop sessions for deeper technical review of these project drivers. Review critics will be invited for 3 key pinups – site strategy, building strategy and final review.

The project is intended to be an iterative design process, refined through drawings and analysis and critic input. The final project deliverable will be a project booklet – at 11x17 format. This will document your semesters work.

d. Attendance

If you are not able to make class you must inform your TA or the professor directly as to reason. More than 2 absences from required classes will be grounds for low pass or incomplete grading. Note that class attendance affects a portion of your grade as well.

5 GRADING

Project development is a team effort. Cohesive group participation is critical to a successful project. Grades are assigned in groups. On the rare occasion, individual grades may be awarded for exceptional performance within a group. Grading is based on the following criteria:

Concept	10%
Individual System Design	20%
Integration of Systems	20%
Quality of Drawings and Oral Presentation	40%
Attendance	10%

Students who have missed more than 2 lectures and workshop classes may be subject to withdrawal from the class or an incomplete grade at end of semester at the discretion of the professor.

Pin-Ups are mandatory and students that fail to attend all Pin-Ups are subject to withdrawal from the class or an incomplete grade at the end of the semester at the discretion of the professor. Students that are forced to miss a Pin-Up must have

FINAL GRADING ASSESSMENT:

High Pass	>90%
Pass	60 – 90%
Low Pass	50 – 60%
Fail	<50%

6 CLASS REFERENCES

a. Reference Texts and Materials

The class will use the following reference texts:

OneNYC Report
SIRR Report
FarRoc Competition Brief and Materials
Kate Ascher, *The Works: Anatomy of a City*, Penguin, 2007
Hillary Brown, *Next Generation Infrastructure*, Island Press, 2013
Jeff Speck, *Walkable City*, North Point Press, 2013
Bry Sarte, *Sustainable Infrastructure*, John Wiley and Sons, 2010

Reference materials are available on courseworks, or on reserve at the library.

b. Professional Reports

Examples of professional reports for site and building strategy planning are available on courseworks. These materials are distributed for the sole purpose of reference material for A4115 and should be treated with discretion.

c. Previous Student Work Examples

Examples of previous student work are included on courseworks as a reference guide. These materials are distributed for the sole purpose of reference materials for A4115 and should be treated with discretion.

d. GIS Tutorials

Use of GIS software is not required, but can be a useful way of developing site information and associated graphics. A tutorial session for GIS will be arranged at the beginning of the semester to familiarize students with use of the software.

7 CLASS SCHEDULE AND LECTURE OUTLINE

1/17	WEEK 1	TOPICS: <ul style="list-style-type: none">- Class Structure, Schedule Overview, Class Project- Introduction to Urban Systems Integration- Introduction of Site and Arverne East Project- Form Teams READING: Far Rockaway competition brief, Resilient NY, Site info.
1/24	WEEK 2	TOPICS: <ul style="list-style-type: none">- Mobility Systems (1)- Water Systems (1) WORKSHOP #1: <ul style="list-style-type: none">- Introduction to Lead Instructors and presentation of Design Teams- Economics and demographics analysis of systems at regional, city and neighborhood scales.- Present Initial Strategy Concepts for a Research institute on the site. READING: FarRoc Competition Brief, Next Generation Infrastructure
1/31	WEEK 3	TOPICS: <ul style="list-style-type: none">- Energy Systems and Climate (1)- Waste Systems and Materials/Resources WORKSHOP #2: <ul style="list-style-type: none">- Mobility and Water/Civil systems Analysis focus. Develop and extract information relevant to site and neighborhood that builds on a concept to intervene on site.- Develop proposed project program to follow conceptual strategy and needs for your research center. READING: To be Assigned
2/3		SITE VISIT: Arverne East site, Local Office. Meet at Beach 60 th St A-train station at 9am
2/7	WEEK 4	TOPICS:

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- Water Systems (2)

WORKSHOP #3:

- Energy and Water/Civil Systems Analysis focus. Look for information on systems that may potentially influence the design of the key buildings on site.
- Begin to organize the site by creating site planning (site parti) principles that respond to surrounding urban systems and create a network of spaces and systems.
- Develop a strategy and concept for land use on the site.

READING: To be Assigned

2/14

WEEK 5

GUEST LECTURE: Digital Connectivity

WORKSHOP #4:

- Lead Instructor overall Review
 - Site Strategy Pin up preparation for next week
 - Finalize decision on what are going to be the urban systems driving the site parti, develop a site strategy and build it further.
 - Continue to add relevant information of systems to project and expand beyond previously analyzed systems onto systems such as digital connectivity, solid-waste strategies, and other urban systems of relevance.
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2/21

WEEK 6

PIN-UP #1 : Site Strategy. Analysis, Site Planning, and Site Programming.

- Address the underlying fundamentals and context of your site and key buildings.
 - Develop a position on what the issues will be for your project and how the building you will be designing will connect into and improve the condition of the urban systems it engages.
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2/28

WEEK 7

NO CLASS (Studio Mid-Term Review Week)

3/7

WEEK 8

GUEST LECTURE: Urban Ecological Systems

WORKSHOP #5:

- Lead Instructor Review
 - Review Pin up#1 feedback. Begin development of building strategy investigation. Identify building site/s, driving systems.
 - Fine tune strategies to integrate infrastructure with building and master-plan.
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3/14

WEEK 9

NO CLASS (Spring Break)

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3/21 **WEEK 10** **TOPICS:**
- Mobility Systems (2)

WORKSHOP #6:
- Mobility and Energy Critic Focus
- Continue to develop Building Strategy and Site Connections
- Draw and diagram urban systems at site and building scale and show an integration strategy for all relevant systems to your project.

3/28 **WEEK 11** **TOPICS:**
- Energy Systems and Climate (2)

WORKSHOP #7:
- Energy and Water/Civil Critic Focus
- Site Strategy Pin up preparation with lead instructor review
- Continue to Develop Building Schematic
- Develop working plans and appropriate sections for building description of how the building integrates systems, connectivity to site and neighborhood

4/4 **WEEK 12** **PIN-UP #2 : Building Concept Review**
- Address the concepts of a single building, and, in particular, how urban systems address the building, shape the building form, and support the building systems.
- Draft a book outline for the final deliverable and organize the different drawings to support your argument and design strategies.

4/11 **WEEK 13** **GUEST LECTURE: Urban Economics**

WORKSHOP #8:
- Lead Instructor Review
- Revisions from Pin up #2 and Book Outline

4/18 **WEEK 14** **WORKSHOP #9:**
- Lead Instructor Review
- Building Development and Book Final Draft

4/25 **WEEK 15** **NO CLASS (Studio Final Reviews)**

5/4 **WEEK 16** **PIN-UP #3 : Final Review**
