

ARCHITECTURAL DESIGN: SYSTEMS AND MATERIALS

Barnard and Columbia Colleges Architecture Department
FALL 2020 ARCH UN2110
Mondays and Wednesdays, 9:00am - 11:50am, Fridays 9:50 - 12:50
Location: TBD

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Office Hours: Monday 12:00 - 2:00 by appointment



The Kid Gets Out of the Picture at Materials and Application, Los Angeles 2016

COURSE DESCRIPTION

This architectural design studio explores material assemblies, techniques of fabrication, and systems of organization. These explorations will be understood as catalysts for architectural analysis and design experimentation. Both designed objects and the very act of making are always embedded within a culture, as they reflect changing material preferences, diverse approaches to durability and obsolescence, varied understandings of comfort, different concerns

with economy and ecology. They depend on multiple resources and mobilize varied technological innovations. Consequently, we will consider that making always involves making a society, for it constitutes a response to its values and a position regarding its technical and material resources. Within this understanding, this studio will consider different cultures of making through a number of exercises rehearse design operations at different scales—from objects to infrastructures.

LEARNING OBJECTIVES

Upon the completion of this course, students should be able to:

- Demonstrate an understanding of design method as a step-by-step, iterative, and incremental process of research, synthesis, and feedback that requires experimentation and risk taking.
- Visually communicate design concepts and design intent using discipline-specific techniques of representation.
- Utilize analog and digital drawing and fabrication technologies in the design process
- Demonstrate the ability to document objects, systems, and process.

PROGRAM

EXERCISE 1: AD-HOC ASSEMBLIES / THE CHOREOGRAPHY OF FUNCTION

The first exercise will operate with available materials, ad-hoc systems of assembly, and precarious arrangements in order to study human behavior, social ritual and cultural identity. Rather than using sophisticated technologies and new materials to contribute to the culture of innovation, we will dwell on the logics of re-use and adaptation. Instead of pursuing ever more comfortable, ergonomic, and useful objects, we will design an artifact that explores the dysfunctions of functionality; taking apart and reconstituting a coherent whole through creative misunderstanding.

Students will first operate at a 1:1 scale and rehearse quick sketching techniques to explore and advance their ideas. Consequently, after a number of workshops introducing digital drawing techniques, students will model their designed artifact and will present it as a patent application

EXERCISE 2: PERFORMATIVE TECHNOLOGIES / DIMENSIONS AND RELATIONS

The second exercise tests digital fabrication technologies and patterned assemblies to advance structures that can be evaluated through their structural and environmental performance. Starting with an exploration of different modes of operating with materials, students will consider how to build three-dimensional modules out of linear elements and flat surfaces. Moving forward, students will rehearse different systems of aggregation for those modules. These modular structures will be used to build an interactive public construction, for which students will first produce a digital model and then physical scale models with the aid of different fabrication technologies.

EXERCISE 3: LIVING STRUCTURE / AUTONOMOUS ISLAND

The final exercise mobilizes the learning of both previous exercises to produce a post-digital garden, in which ad-hoc and patterned assemblies coexist, precarious and structurally sound aggregations are re-assembled from an inventory of available 'material' to build a new landscape. Students will go back and forth between digital models and material experiments, and are expected to produce a comprehensive documentation of their projects.

DESIGN AND TECHNICAL SKILLS

The studio curriculum will be an introduction to fundamental design and technical skills. Workshops will be offered both in class and outside studio sessions to support software tutorials. In addition to periodic presentations by the studio critic and the TA, DAL Assistants will conduct other informal evening workshops focusing on techniques and methods relevant to ongoing projects. These sessions are optional but you are strongly encouraged to attend. Students in this course are required to gain proficiency in the following:

Architectural Drawings

Analytical Diagrams

Plans, Elevations, Sections

Three dimensional drawings: Axonometric, Isometric, Perspective, etc.

Freehand Sketching

Modeling Skills

Different Skills using a variety of materials including paper, wood, chipboard, foam core, wire, plexiglass, etc.)

Digital Fabrication techniques including Laser Cutting and 3D printing

Software Skills

Line drawings using Adobe Illustrator

2D/3D Perspectives and Collages using Adobe CS

Three-dimensional modeling using Rhino

COURSE REQUIREMENTS AND ASSESSMENT CRITERIA

PREREQUISITES

This is an introductory level design studio for students interested in thinking about architecture and is required for those majoring in Architecture. There are no prerequisites, with the exception of a passion and a will to speculate. It is generally recommended for the sophomore year, and can be taken before or after Architectural Design: Systems and Materials. Systems and Materials and Environments and Mediations complement each other, with the former concentrating on material assemblies, techniques of fabrication, and systems of organization and the later on modes of visualization, technologies of mediation, and environmental transformations.

STUDIO PROCEDURES

This course is taught by the studio method. The core method of instruction is that of 'desk critiques' (also referred to as desk crits), a one-to-one dialogue at the desk between the student and the faculty (also described as "studio critics") or teaching assistants (TA). At the desk crit, previous design work is reviewed and discussed and the student and faculty formulate the next steps in the process. Desk crits are supplemented by Interim Reviews, or 'Pinups', where all students in the studio present their design ideas for group critique and discussions. The culmination of each project is the Final Review in which students present their work for public evaluation by a group of Studio Critics and/or Visiting Critics.

Each student will have a desk in 404 Diana. You should anticipate using time during class (class meets 6 hours a week) and an average of 8 hours a week outside of class to complete the work required in this course. You will be expected to use the studio for your work after hours, taking

advantage of your peers for feedback throughout the design process. You will be expected to equip your desk with the necessary tools and materials for your projects. No excuses for incomplete work should be made for lack of equipment. Each project will use different equipment and materials and more specific purchases should be made at that time.

ATTENDANCE

You are encouraged to work in the studio and to take advantage of the shared learning environment to discuss your work with your peers. Attendance is mandatory at all scheduled classes, field trips, and reviews. Studio is held Monday, Wednesday, and Friday beginning promptly at 9:00 AM (9:50 on Friday). Any student arriving after 9:20 AM will be considered late and anyone that arrives after 10:00 AM will be marked absent. Absences due to acute illness, a personal crisis (e.g. a death in the family), religious observance, or for other reasons of comparable gravity may be excused. In all such cases, students must promptly email their instructor to communicate the reason for their absence and to arrange an opportunity to review any important information they may have missed. Students who know they will miss a scheduled class due to religious holidays should email their instructor during the first week of classes with a list of dates for their anticipated absences. Unexcused absences, late arrivals, or early departures from class will reduce your course grade. Two unexcused absences in any project will result in a grade reduction by one-third ($1/3$) of one letter grade (e.g., A- to B+) for that project. Unexcused absences for pin-ups or reviews will result in a grade reduction of one letter grade (e.g., A to B) for that project. Four unexcused absences in the semester result in an additional grade reduction of one-third ($1/3$) of one letter grade (e.g., A- to B+).

GRADING

Each project will be graded with a letter grade. Work will be evaluated by the following criteria:

1. Depth of investigation and critical thinking skills
2. Understanding of abstract architectural ideas
3. Iterative design process
4. Ability to articulate ideas verbally
5. Ability to express concepts via well crafted tectonic compositions
6. Precision of drawings using a range of graphic conventions
7. Participation during design crits and timeliness of assignment completion

Additionally, you will maintain a sketchbook throughout the semester that will be used for sketching and writing notes for all projects. This sketchbook will be reviewed during desk crits and may be required for grading.

PROJECT GRADING BREAKDOWN

Project #1: 35%

Project #2: 30%

Project #3: 35%

Students are required to present their work in all pin-ups and reviews, and work not presented at the designated time will not be reviewed at a later date. Required project deliverables that were not completed at the Final Review must be completed in time for grading. Additional work completed after the Final Review and before grading will not be considered at the grading session unless otherwise stated by the Studio Critics.

STUDIO MATERIALS AND EQUIPMENT

The items on this list will continue to be useful throughout your careers as designers, and should be considered investments in quality tools. However, they are precision instruments and some of them are expensive. If you are uncomfortable purchasing some of these items for yourself please check with the Department Assistant about borrowing used equipment.

- Sketchbook (minimum size 8"x10")
- T-Square and drawing area
- architects' scale (6 sided)
- 12" roll of white tracing paper
- lead pointer, lead holder, leads (4H, 2H, HB, 2B)
- Olfa or similar utility knife with breakaway blades (and replacement blades)
- 24" metal ruler with cork backing
- self-healing cutting mat
- model making materials (as needed throughout the term, including Sobo glue)

HONOR CODE

The Barnard Honor Code applies to all students in this class regardless of academic affiliation. Approved by the student body in 1912 and updated in 2016, the Code states:

We, the students of Barnard College, resolve to uphold the honor of the College by engaging with integrity in all of our academic pursuits. We affirm that academic integrity is the honorable creation and presentation of our own work. We acknowledge that it is our responsibility to seek clarification of proper forms of collaboration and use of academic resources in all assignments or exams. We consider academic integrity to include the proper use and care for all print, electronic, or other academic resources. We will respect the rights of others to engage in pursuit of learning in order to uphold our commitment to honor. We pledge to do all that is in our power to create a spirit of honesty and honor for its own sake.

The Columbia College Honor Code and the Columbia College Faculty Statement on Academic Integrity can be viewed here

<https://www.college.columbia.edu/honorcode>

<https://www.college.columbia.edu/faculty/resourcesforinstructors/academicintegrity/statement>

ACADEMIC ACCOMMODATIONS

If you are a student with a documented disability and require academic accommodations in this course, you must register with the Center for Accessibility Resources & Disability Services (CARDS) for assistance. Students requesting accommodations will need to first meet with a CARDS staff member. Once registered, students are required to request accommodation letters each semester to notify faculty. Accommodations are not retroactive, so it is best to contact CARDS early each semester to access your accommodations. If you are registered with CARDS, please see me to schedule a meeting outside of class in which you can bring me your faculty notification letter and we can discuss your accommodations for this course. Students are not eligible to use their accommodations in this course until they have met with me. CARDS is located in 101 Altschul. Columbia ODS is located in Wien Hall, Suite 108A.

AFFORDABLE ACCESS TO COURSE TEXTS

All students deserve to be able to access course texts. The high costs of textbooks and other course materials prohibit access and perpetuate inequity, and Barnard librarians are partnering with students, faculty, and staff to increase access. By the first day of advance registration for each term, you should be able to view on Canvas information provided by your faculty about

required texts (including ISBN or author, title, publisher and copyright date) and their prices. Once you have selected your classes, here are some cost-free methods for accessing course texts, recommended by the Barnard Library: find out if your faculty has placed the texts on reserve at Barnard Library or another Columbia library, and look for course texts using *CLIO* (library catalog), *Borrow Direct* (request books from partner libraries), *Interlibrary Loan* (request book chapters from any library), and *NYPL*. Students with financial need or insecurity can check items out from the FLIP lending libraries in the Barnard Library and Butler Library and can consult with the *Dean of Studies* and the *Financial Aid Office* about additional affordable alternatives for getting access to course texts. Talk with your librarian and visit the *Barnard Library Textbook Affordability guide*(library.barnard.edu/textbook-affordability) for more details.

WELLNESS

It is important for undergraduates to recognize and identify the different pressures, burdens, and stressors you may be facing, whether personal, emotional, physical, financial, mental, or academic. We as a community urge you to make yourself—your own health, sanity, and wellness—your priority throughout this term and your career here. Sleep, exercise, and eating well can all be a part of a healthy regimen to cope with stress. Resources exist to support you in several sectors of your life, and we encourage you to make use of them. Should you have any questions about navigating these resources, please visit these sites:

- Barnard Students: <https://barnard.edu/wellwoman/about>
- Columbia Students: <http://www.college.columbia.edu/resources> Click on Health-Wellness
- Columbia GS Students: <https://gs.columbia.edu/health-and-wellness>
- Columbia SEAS Students: <http://gradengineering.columbia.edu/campus-resources>

CLASS SCHEDULE

Week 01		Exercise 1
Monday	01/011/21	Syllabus and Course overview Introduce Exercise 1: The Choreography of Function
Wednesday	01/013/21	Exercise 1A: Pinup
Friday	01/015/21	DAL introduction, Digital Workshop 01
Week 02		
Monday	01/18/21	Martin Luther King Jr. Day - No Class
Wednesday	01/20/21	Exercise 1A: Due
Friday	01/22/21	Introduce Exercise 1B, Digital Workshop 02
Week 03		Exercise 2

Monday	01/25/21	Pinup
Wednesday	01/27/21	Desk Crits
Friday	01/29/21	Exercise1B: Due

Week 04

Monday	02/01/21	Exercise 2: Discussion
Wednesday	02/03/21	Desk Crits
Friday	02/05/21	Desk Crits

Week 05

Exercise 3

Monday	02/08/21	Exercise 2: Due / Midterm
Wednesday	02/10/21	Exercise 3: Discussion
Friday	02/12/21	Desk Crits

Week 06

Exercise 3

Monday	02/15/21	Pinup
Wednesday	02/17/21	Desk Crits
Friday	02/19/21	Desk crits

Week 07

Monday	02/21/21	Exercise 3: Final Review
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