MIT Department of Architecture
4.022: Design Techniques and Technologies, Spring 2026
MW 2:00-5:00pm; Room 7-434
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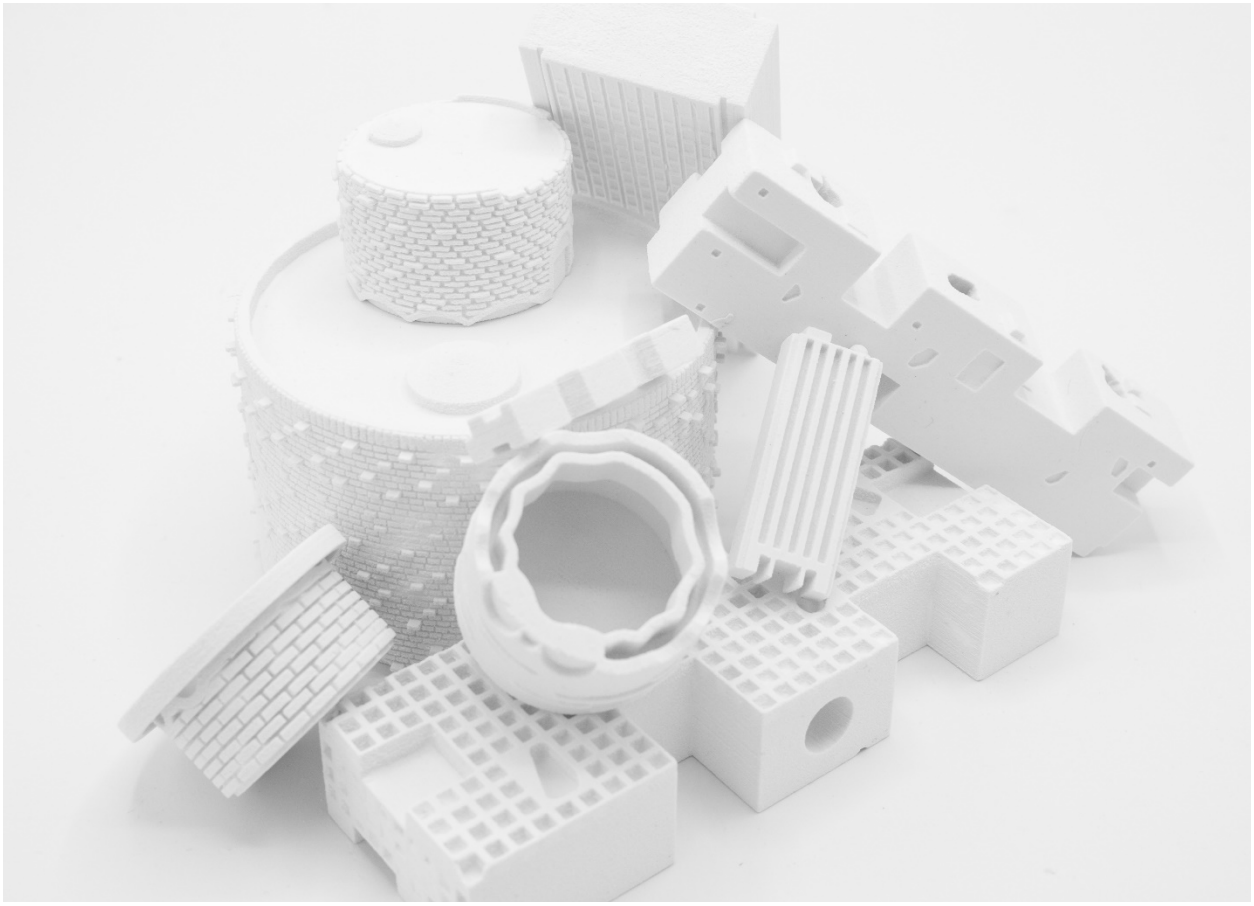
4.022 Design Techniques and Technologies

Course Syllabus and Information



Collection of miniatures, photo by Evan Ortiz

Overview

This studio introduces the tools, techniques and technologies of architecture across a range of projects in a studio environment. The studio will explore observation, measurement, drawing, and physical making as instruments for generating and conveying ideas. The semester is organized around three parts. Each part will focus on different methods and mediums, but emphasize the common themes of iterative testing, precision, and material craft. Work will be supported by a range of digital design and fabrication technologies. Throughout, students will also be prompted to consider their work within a broader set of cultural, technical, and historic contexts. Course format will include a combination of workshops, lectures, one-on-one instruction, and periodic reviews with guest critics.

Part 1 – Precision: Drawing

This is our warm-up. Part 1 is about *precision*. More specifically, Part 1 explores precise description of form through drawing. Precision in architecture and design is characterized by exactness. In Part 1, students will work through orthographic and oblique projection drawings. The drawings will explore form through exactness and precise delineation. Shape is defined by visible geometry, but form is defined by both visible and invisible geometries that underly, drive, and motivate an object's shape. Exercises will prioritize precision drawing, technical drawing standards, and objective ways of looking.

Part 2 – Resolution: Making

This is our semester project. Part 2 is about *resolution*. Resolution in architecture and design is a relative term describing the amount of information in a given description, e.g. low-resolution vs high-resolution images. If Part 1 describes objects with a high degree of resolution through a single medium (technical drawing), Part 2 explores description through a wider range of resolutions and media. This widening is accompanied by an expanded formal toolkit. Questions of resolution will be both an act of design and a negotiation with specific methods, scales, and materials. The project will include a series of sub-assignments that develop sequentially and progress from 2D to 2.5D to 3D. Ultimately, students will construct a series of physical objects that traverse multiple resolutions.

Part 3 – Communication: Synthesizing

This is our cool-down. Part 3 is about *communication*. Students will use this phase to consider how their work is communicated to an outside audience. Methods of displaying work will be explored and implemented for a culminating Final Review.

Course Communications
Course information, assignments briefs, and submission deadlines will be distributed via Canvas. Coursework submissions will also occur via Canvas. The Canvas course homepage can be found here:

https://canvas.mit.edu/courses/36945

Updates to the course schedule and content will be issued via Canvas announcements and/or to your MIT email address (Canvas announcements should be set to email your MIT address). Students are responsible for checking email regularly throughout the course. Students are also encouraged to email the instructor and/or TA with any questions, concerns, or requests that may arise during the course.

Learning Objectives
The course consists of three projects exploring various topics through drawing and physical fabrication. Students should be able to engage with an increasing level of design research through iterative studies and move fluidly between different modes and scales of operation. Conventions of design representation and communication through drawing and modeling will be explored. Students will need to demonstrate basic application of design skills, understanding of conventions, and an ability to sustain an increasing level of research in the projects over the semester.

Completion Requirements
Completion of each of the exercises, rigor in process and clarity in representation, as well as the overall progress of the semester (including attendance) will be fundamental to completing the course.

Attendance Policy
Attendance for the full duration of each class is mandatory. The studio is an exceptional learning environment that requires your physical and intellectual presence. You are allowed three excused absences for the semester. An excused absence is defined as one that was discussed with and approved by the professor at least 24 hours prior to the date of absence, or a family or medical emergency that is confirmed by your physician or a dean in Student Support Services. Unexcused absences will reduce the course grade by half a letter grade, at minimum. Late arrival or early departure from class will count as a partial absence. Absences beyond the three allotted will result in a decrease in your final grade. If you miss six or more studio classes, you will be asked to drop the subject or receive a failing grade.

Evaluation Criteria and Grading:
The following criteria will be used for the evaluation of student's work, both in terms of helping their progress and in final grading. (01) Concept: How clearly is the student articulating the conceptual intentions? (02) Translation of Concept: How well is the student using their concept to develop a design response to given problems? (03) Representation Appropriateness: How well matched is the student's choice of representational means to their intentions? (04) Representation Quality: How accomplished are students with drawing, modeling, and/ or digital representation? To what degree do students' representations convey what they ought to? (05) Oral Presentation Skills: How clearly are students presenting their ideas orally, whether at their desk, in class discussions, or to a more formal jury? (06) Participation in Discussions: How actively and how constructively are students involved in class discussions, both formally and informally? (07) Response to Criticism: How do students effectively take advantage of criticism from instructors, classmates and outside jurors? (08) Auto-Critical Skills: To what extent are students able to critique their own work regularly and effectively? (09) Attendance – see next page.

A: Excellent — Project surpasses expectations in terms of inventiveness, appropriateness, verbal and visual ability, conceptual rigor, craft, and personal development. Student pursues concepts and techniques above and beyond what is discussed in class.

B: Above Average — Project is thorough, well researched, diligently pursued, and successfully completed. Student pursues ideas and suggestions presented in class and puts in effort to resolve required projects. Project is complete on all levels and demonstrates potential for excellence.

C: Average — Project meets the minimum requirements. Suggestions made in class are not pursued with dedication or rigor. Project is incomplete in one or more areas.

D: Poor — Project is incomplete. Basic skills including graphic skills, model-making skills, verbal clarity or logic of presentation are not level-appropriate. Student does not demonstrate the required design skill and knowledge base.

F: Failure — Project is unresolved. Minimum objectives are not met. Performance is not acceptable. This grade will be assigned when you have excessive unexcused absences.

Studio Culture
Work in studio will build sequentially. Therefore, your commitment to continual development on a daily basis is of paramount importance. It is important that you take advantage of the studio environment. Magnification of your development as a designer is made possible by the collective nature of the class. Group reviews are collective for a reason. Each of you has something to gain form your peers. Since studio is a place for all, it necessitates the careful attention to the needs of everyone in it. Please see your instructor and TAs if there are any problems that you are unable to resolve on your own.

Personal Conduct
Instructors, TAs, and students in this course are expected to act responsibly, ethically, and with respect for the dignity of all others, both within and outside the classroom. Issues relating to personal conduct, including discrimination and harassment, will be taken extremely seriously. Students should take the time to become familiar with MIT's major policies on personal conduct, which can be found here:

MIT Policies: Conduct and Community Standards

Academic Integrity/ Honesty
Massachusetts Institute of Technology students are here because of their demonstrated intellectual ability and because of their potential to make a significant contribution to human thought and knowledge. At MIT, students will be given unusual opportunities to do research and undertake scholarship that will advance knowledge in different fields of study. Students will also face many challenges. It is important for MIT students to become familiar with the Institute's policies regarding academic integrity, which can be found here:

Academic Integrity at MIT: A Handbook for Students

Medical
If you are on a Medical Hold or experience illness during the semester, then please contact your instructors so we can make sure you have access to course materials and we can discuss how we address the missed work. You can also contact Student Support Services for additional assistance.

Student Support Services (S3)
If you find that something is getting in the way of your ability to attend class, complete work, or take an exam, you should contact a dean in Student Support Services (S3). The deans will provide you with support and help you work with us to determine next steps. We ask that you go to S3 so we know you have had a chance to talk through your situation with someone and to connect with any resources you might need. The walk-in queue is open from 10-12 and 2-4 on weekdays. Appointments can be virtual or in-person, depending on your comfort and convenience. For more information or to join the virtual help queue visit studentlife.mit.edu/s3 or e-mail s3-support@mit.edu.

Disability Accommodation and Access Services
MIT is committed to the principle of equal access and an inclusionary environment. Students who need any form of accommodation are encouraged to speak with the instructor as early as possible. Students who need disability accommodations are encouraged to speak with Disability and Access Services (studentlife.mit.edu/das), prior to or early in the semester so that accommodation requests can be evaluated and addressed in a timely fashion.

If you have a disability and are not planning to use accommodations, it is still recommended that you meet with DAS staff to familiarize yourself with their services and resources. Contact Disability and Access Services with any questions at 617-253-1674 or via email das-student@mit.edu.

Schedule

Note: schedule is subject to change. Refer to assignment briefs and instructor communications for latest schedule information.

Week	*Date*	*Day*	*Time*	*Agenda*
	PART 1 — PRECISION: DRAWING (WARM-UP)			
01	2/2	M	2:00	Introduction to Studio & Overview
	2/4	W	2:00 3:00	**Assigned: Assignment 1.1 & 1.2** *Workshop 1: Getting Started with Rhino and Layouts*
02	2/9	M	2:00 2/4pm	**Pin Up: Assignment 1.1 & 1.2** **Assigned: Assignment 1.3** *Workshop 2: Oblique Drawing*
	2/11	W	2:00	**Pin Up: Assignment 1.3**
	PART 2 — RESOLUTION: MAKING			
03	2/16	M		No Class — President's Day
	2/17	T	2:00 3:00	Introduction to Part 2 & Assignment 2 **Assigned: Assignment 2.1** *Workshop 3: Lasercutting*
	2/18	W	2:00	Desk Crits; In Class Work Session
04	2/23	M	2:00	Desk Crits; In Class Work Session
	2/25	W	2:00	Desk Crits; In Class Work Session
05	3/2	M	2:00	**Pin Up: Assignment 2.1**
	3/4	W	2:00 3:00	**Assigned: Assignment 2.2** *Workshop 4: Relief Methods (3D Printing, Imprinting Clay, Embossing Paper, Paper Casting)*
06	3/09	M	2:00	Desk Crits; In Class Work Session
	3/11	W	2:00	Desk Crits; In Class Work Session
07	3/16	M	2:00	**Preview Review: Assignment 2.1 & 2.2**
	3/18	**W**	**2:00**	**Final Review: Assignment 2**
08	3/23	M		No Class — Spring Break
	3/25	W		No Class — Spring Break
09	3/30	M	2:00 3:00	**Assigned: Assignment 3.1** *Workshop 5: Rhino 3D Modeling*
	4/1	W	2:00	Desk Crits; In Class Work Session

			3:00	*Workshop 6: Photo Documentation*
10	4/6	M	2:00	**Pin-Up: Assignment 3.1**
	4/8	W	2:00 3:00	**Assigned: Assignment 3.2** *Workshop 7: Casting, Location N-52*
11	4/13	M	2:00	Desk Crits; In Class Work Session
	4/15	W	2:00	Desk Crits; In Class Work Session
12	4/20	M		No Class — Patriot's Day
	4/22	W	2:00	Collective Table Crits & Discussion
13	4/27	M	2:00	Desk Crits; In Class Work Session
	4/29	W	2:00	Desk Crits; In Class Work Session

PART 3 – COMMUNICATION: SYNTHESIZING (COOL-DOWN)

14	5/4	M	2:00	**Final Review: Assignment 3**
	5/6	W	2:00 3:00	**Assigned: Assignment 4** *Workshop 8: InDesign & Portfolio*
15	5/11	M	2:00	Last Class; Group Discussion
16	5/18	M	4:30	**Assignment 4 Due for Canvas Submission**

Suggested Readings

Robin Evans, "Translations from Drawing to Building," *Translations From Drawing to Building and Other Essays* (1997), p. 153-189.

Stan Allen, "*Points + Lines*," (1999), p. 92-103.

Sam Jacob, "Vriesdendorp Syndrome: Overwhelmed by the Geographies of Sensation, Memory, and Plenty," *Perspecta 41* (2008), p. 30–35.

Susan Stewart, "Objects of Desire," *On Longing: Narratives of the Miniature, the Gigantic, the Souvenir, the Collection* (1991), p. 132-151.