School of Architecture | Georgia Tech | Fall 2026

ARCH 6020: Media + Modeling II (3 credits)

Required Course for M. Arch 2 and M. Arch 3

Graduate Offering

ARCH 6020 Syllabus

Media + Modeling II (3 credits)

Fall 2026

Instructor Information

Course Coordinator: **Hyojin Kwon**

Instructor:

Section A
Classroom: Arch West Room 359
Hyojin Kwon: hkwon314@gatech.edu
Office location: Arch West Room 355
Office Hours: Thursday 1:00 – 2:00 pm, by appointment

Section B Classroom: Arch West Room 358
Yichao Shi: yshi431@gatech.edu
Office location: Hinman Research Building Room 234
Office Hours: Tuesday 3:30 – 4:30 pm, by appointment

TA: **Zherui Liu : zliu3064@gatech.edu**
Office location: Hinman Research Building Room 234
Office Hours: Wednesday 1:00 – 2:00 pm, by appointment.

General Course Information

Course Description

Intermediate approaches to two and three dimensional modeling and representation in architecture using both manual and digital media techniques.

Course Learning Outcomes

Course Overview

In the last three decades, architectural praxis has undergone a paradigmatic shift, precipitated by what Jonathan Crary delineates as a seismic transformation in visuality—a metamorphosis arguably more momentous than the historical divide between medieval iconography and Renaissance perspectivism. This shift has precipitated the dissolution of erstwhile stable graphic conventions within architecture, replaced by an ever-expanding lexicon of computational mediums.

This proliferation of digital media paradigms has not only fundamentally transmuted the norms of architectural representation and materialization but has also catalyzed emergent possibilities for the conceptualization and perception of architectural images and forms. In this era, marked by post-digital and post-orthographic sensibilities, designers are increasingly engaging in the opportunistic amalgamation of diverse tools, crafting novel design media and methodologies. This endeavor engenders unprecedented modalities of design praxis, redefining the essence of architectural design.

This course is an introduction to fundamental concepts, techniques, and methods related to computational design, with a focus on reciprocal processes of translation between digital media and material artifacts. Developments in digital tools have facilitated increasingly intricate processes of formal exploration and material manipulation. Novel computational strategies can integrate a variety of material-specific design considerations into the design process and have enabled new methods for material exploration. In this course, you will learn how to think algorithmically, critically engage the capacities and limitations of select computational techniques and processes and investigate the latent design opportunities embedded in each one.

Course Objectives

Our exploration will be categorized into four interrelated thematic areas – digitization, simulation, materialization, and visualization. Each thematic area will act as a lens through which to reconsider the role and agency of computational thinking and design. The course will address the content described above through a combination of lectures, discussions, technical workshops, and design exercises. Lectures, readings, and in-class discussions will situate them within a theoretical and historical context. Digital processes, including algorithmic drawing, imaging, modeling, animating, physics-based simulation, and rendering, along with select digital and analog fabrication processes, will be introduced via a series of hands-on workshops. Technical workshops will introduce software including Rhino/Grasshopper along with its associated plugins for analysis, simulation, and animation and some AI imaging tools DALL-E, Stability AI, and Stable Diffusion.

The objective is to gain literacy and fluency in computational design practices profitably as a way of opening up and expanding architecture's own design conventions and culture. Ultimately the question persists, what can procedural algorithmic modeling make that traditional forms of drawings cannot make? And by working with multidimensional digital media, what is lost to the traditions of architectural orthographic thinking?

Those students who successfully complete the course will be able to:

- 1. Apply intermediate-level computational design techniques to create two and three-dimensional architectural models.
- 2. Utilize Rhino/Grasshopper and associated plugins for parametric design, simulation, and visualization tasks.
- 3. Critically assess the capabilities and limitations of various computational design tools and processes.
- 4. Develop and present complex design projects that integrate digital and physical modeling techniques.
- 5. Demonstrate the ability to work collaboratively on design projects, effectively communicating ideas and integrating feedback.
- 6. Explore and exploit the design opportunities presented by algorithmic thinking and computational processes.

Note: For all M. Arch courses, see also "Professional Standards Addressed."

Required Course Materials

Computer and Software

Students are required to have access to a personal laptop that meets the Georgia Tech School of Architecture hardware and software requirements. Students are responsible for ensuring access to and installation of the software required for coursework, using Georgia Tech resources, educational licenses, or other approved means as appropriate. Software requirements may vary by assignment.

For current School of Architecture hardware and software requirements, see:
https://arch.gatech.edu/hardware-and-software-requirements

Grading Policy

The presented concepts and techniques will be explored through a semester-long project organized into a sequential set of assignments. Beginning with the process of parametric drawing, students will explore a variety of modeling and form-making strategies using a collection of digital and fabrication tools. Subsequent assignments will explore the affordances of specific modeling techniques and examine the relationship of the presented technique to architectural concerns, including scale, materiality, originality, and authorship. Each assignment will invite opportunities for scalar translation, ranging from 1:1 to scaleless to various scales over physical and digital models with a focus on reciprocal materiality, structure, and organization changes. For the final project, participants will work in small groups to utilize the workflows presented in class in a collaborative design exercise. Anticipated costs include materials for two physical modeling exercises, executed in groups, at the final reviews.

Assignments

The semester-long project Is structured In five assignments:

- Assignment 1 - Points, Lines & Curves - 100 pts

- Assignment 2 - Attractors & 2D Vector Fields - 100 pts
- Assignment 3 - Attractors & 3D Surfaces - 100 pts
- Assignment 4 - Shape to System: 2d Parti, 3D Parti, System - 300pts
- Assignment 5 - Image to 3D Form & Simulation - 300pts

Description of Graded Components

Assignments are weighted as follows:

Grades will be evaluated based on the experimental ambition of the assignments, conceptual clarity, rigor and precision of execution as evidenced by submitted models, digital files, presentations, review interactions and class participation. Students will not receive a final grade until all required documentation for each assignment has been submitted as specified by the instructor in the associated assignment brief.

There will be five cumulative assignments. Detailed briefs with specific deliverables and grading criteria for each assignment will be distributed when the assignment is introduced to the class. The relative weight of the assignments are as follows:

- 10% Course Attendance + Participation
- 10% Assignment 1
- 10% Assignment 2
- 10% Assignment 3
- 30% Assignment 4
- 30% Assignment 5

Grading Scale:

- A: 90-100%
- B: 80-89%
- C: 70-79%
- D: 60-69%
- F: Below 60%

No incompletes will be awarded without appropriate reason or without a prior meeting, either in person or on Teams, between the student and the instructor. All assignments must be completed to receive a passing grade in the class. Incompletes will be granted only under extraordinary circumstances.

At the end of the term, students are asked to complete the online course evaluation for all courses at Georgia Tech.

Course Schedule

Please note that this schedule is subject to periodic revisions throughout the term. Updated schedules will always be posted on Canvas.

DATE	DAY	WEEK		Assignment
08/25	TU	1	Introduction Lecture by Hyojin Kwon	
08/26	TH	1	Grasshopper UI, Data, Data Management, Transformations I (Move, Rotate, Scale, etc)	Issue: Assignment 01
09/01	TU	2	Roof Structure Design	
09/03	TH	2	2D Mapping: Vectors, Attractors, Fields	Due: Assignment 01 Issue: Assignment 02
09/08	TU	3	2D Mapping: Architectural Fields	
09/10	TH	3	Mathematical Surface I + II	Due: Assignment 02
09/15	TU	4	Transformations II – Boolean, Lofting, etc	
09/17	TH	4	Lecture by Yichao Shi - 2D Parti + Shape Grammar	Due: Assignment 03
09/22	TU	5	2D Parti Shape Grammar Case Study	Issue: Assignment 04.1
09/24	TH	5	2D Parti Shape Grammar Case Study	
09/29	TU	6	2D Parti Shape Grammar Implemented with Grasshopper	
10/01	TH	6	Case Study - 3D Parti / Massing	Due: Assignment 04.1
10/05	TU	7	3D Parti Shape Grammar Implemented with Grasshopper	
10/07	TH	7	3D Parti Shape Grammar Implemented with Grasshopper	
10/12	TU	8	NO CLASS - Fall Break	
10/14	TH	8	Case Study - Building Systems	Due: Assignment 04.2
10/19	TU	9	Façade Design / Patterning / Envelop System	
10/21	TH	9	Façade Design / Patterning / Envelop System	
10/26	TU	10	Façade Design / Patterning / Envelop System	
10/28	TH	10	Mid-Term Review	Due: Assignment 04.3
11/02	TU	11	Lecture by Hyojin Kwon - Image to 3D, Digital Image, Computational Color	Issue: Assignment 05
11/04	TH	11	Image to 3D, Digital Image, Computational Color	
11/09	TU	12	Image to 3D, Digital Image, Computational Color	
11/11	TH	12	Stable Diffusion / AI	
11/16	TU	13	Stable Diffusion / AI	
11/18	TH	13	Stable Diffusion - Wall Tectonic, Facade System, Morph,	
11/23	TU	14	NO CLASS - Non-studio ARCH Classes Cancelled	
11/25	TH	14	NO CLASS - Non-studio ARCH Classes Cancelled	
11/30	TU	15	NO CLASS - Thanksgiving Breaks	
12/02	TH	15	NO CLASS - Thanksgiving Breaks	
12/07	TU	16	Desk Crits / Individual Project Feedback (Zoom)	
TBD		17	Final Review	Due; Assignment 05

Supplemental Information *(required for all M. Arch courses)*

Professional Standards Addressed

NAAB Conditions for Accreditation

For Professional Degree Programs in Architecture (2020)

The accredited degree program must demonstrate that each graduate possesses the knowledge and skills defined by the criteria below. The knowledge and skills defined here represent those required to prepare graduates for the path to internship, examination, and licensure, and to engage in related fields. The program must provide student work as evidence that its graduates have satisfied each criterion.

The criteria encompass two levels of accomplishment:

- *Understanding*—The capacity to classify, compare, summarize, explain, and/or interpret information.
- *Ability*—Proficiency in using specific information to accomplish a task, correctly selecting the appropriate information, and accurately applying it to the solution of a specific problem, while also distinguishing the effects of its implementation.

Program Criteria (PC) and Student Criteria (SC): The NAAB establishes PC and SC to help accredited degree programs prepare students for the profession while encouraging education practices suited to the individual degree program.

For the purpose of accreditation, while this course will cover more criteria than the ones listed below, the following will be actively covered:

PC.2 – Design: How the program instills in students the role of the design process in shaping the built environment and conveys the methods by which design processes integrate multiple factors, in different settings and scales of development, from buildings to cities. This content is Practiced in this course.

PC.7 – Learning and Teaching Culture: How the program fosters and ensures a positive and respectful environment that encourages optimism, respect, sharing, engagement, and innovation among its faculty, students, administration, and staff. This content is Practiced in this course.

SC.4 – Technical Knowledge: How the program ensures the students understand the established and emerging systems, technologies, and assemblies of building construction, and the methods and criteria architects use to assess those technologies against the design, economics, and performance objectives of projects. This content is Practiced in this course.

Course Policies

USG + Georgia Tech Required Policies

Attendance and/or Participation

Regular attendance, preparation, and active participation are essential to studio learning and are included in the Studio Participation & Documentation component of the final grade. Students are expected to attend all scheduled studio meetings, critiques, reviews, field visits, workshops, and other required course activities.

Students should communicate anticipated absences as early as possible and follow the School of Architecture and Georgia Tech policies below regarding excused absences and documentation.

Missing three classes without an approved excuse will result in a letter grade reduction. Missing more than three classes, excused or unexcused, might result in a meeting with your instructor and the Architecture Program Office to determine a course of action and can result in an incomplete grade (I) or a failing grade (F) of this course.

SoA Attendance Policy

Active participation at all class meetings is mandatory. Absences will be excused only for medical or family emergencies, Institute-approved events, and religious holidays documented in writing. (Notify your instructor in writing during the first two weeks of the semester about any anticipated religious holiday absences.) Late arrivals will be counted as absences.

Attendance of SoA lectures during studio time on Monday or Wednesday from 12:30–1:30 p.m. is required for M. Arch students and highly recommended for B.S. Arch, M.S., and Ph.D. students.

NOTE: Absences due to special and/or unforeseen circumstances must be discussed with the instructor as early as practically possible.

Missing three classes without an approved excuse will result in a letter grade reduction. Missing more than three classes, excused or unexcused, may result in a meeting with your instructor and the Architecture Program Office to determine a course of action, and can result in an incomplete (I) or failing grade (F).

Students are highly encouraged to submit absence verification for documented illness, hospitalization, accidents, family emergencies, or lengthy illnesses to the Dean of Students: https://studentlife.gatech.edu/request-assistance

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards.

Review Georgia Tech's Honor Code and the student Code of Conduct. Any student suspected of cheating or plagiarism will be reported to the Office of Student Integrity.

For expectations of student and instructor conduct, consult Code of Conduct (rules/19) and Student-Faculty Expectations (rules/22).

Student-Faculty Expectations Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body.

The Student-Faculty Expectations Agreement articulates some basic expectations that you can have of me and that I have of you. Simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek.

Core IMPACTS

Core IMPACTS is the University System of Georgia's General Education curriculum. If you are teaching a course that counts towards Core IMPACTS, you should include a syllabus statement about the Core area and associated career competencies. This resource from Georgia State University includes template syllabus statements for each Core IMPACTS area that you may adapt for your course.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) as soon as possible to make an appointment, obtain an accommodations letter, and discuss your special needs. Please also schedule an appointment with your instructor to discuss your learning needs.

Optional Policies, Expectations, and Resources

1. Generative AI Use Encouraged

In this course, the use of Generative AI tools is encouraged as part of your learning and creative process. Responsible use is expected. All submitted work must include a brief AI Usage Statement outlining: which tools were used, when they were used, what prompts or questions were given, and how the AI output informed or shaped your final submission. Use of Generative AI must comply with Georgia Tech's Honor Code and academic integrity guidelines.

Inclement Weather and Digital Learning Days

If campus operations are modified due to inclement weather or other emergencies, class may be moved online or otherwise adjusted in accordance with Georgia Tech policy. Any changes will be communicated through Canvas and/or email.

CIOS — Course Evaluations

At the end of the term, students are asked to complete the online course evaluation for all courses at Georgia Tech (https://gatech.smartevals.com). CIOS scores and comments have different degrees of visibility based on roles:

Reporting access by role	CIOS Scaled Results	CIOS Comments	TA's Scaled Results	TA's Comments
Instructor	Their Own	Their Own	All within their own course	All within their own course
TA Supervisor	N/A	N/A	All within their own course	All within their own course
Teaching Assistant	None	None	Their Own	Their Own
School Administration	All within their own unit	None	All within their own unit	All within their own unit
Students	All – Summary only	None	None	None

More information: CIOS Student FAQ

Campus Resources for Students

Undergraduate Student Academic Success Resources

A list of resources for undergraduate students' academic success and advising can be found at Success at Tech. Academic Support (a unit in the Office of Undergraduate Education & Student Success) provides free tutoring: success.gatech.edu/tutoring.

Graduate Student Academic and Professional Success Resources

A list of resources for graduate students is available on the Office of Graduate and Postdoctoral Education website.

Student Well-Being

At Georgia Tech, we are concerned about your overall physical, social, and mental well-being. A comprehensive list of wellness-related resources has been compiled by the Office of the Vice President for Student Engagement and Well-being.

Library & Archives

Contact your Architecture Library subject specialist, Catherine Manci (catherine.manci@library.gatech.edu), for research help and information on available resources.

Contact your Architecture Archives liaison, Jody Thompson (jody.thompson@library.gatech.edu), for assistance with archival research and collections.

Georgia Tech Library: https://library.gatech.edu/ Georgia Tech Archives: http://library.gatech.edu/archives

Approved Communication Platforms

Georgia Tech Approved Communication Platforms

Georgia Tech Values Statement

At Georgia Tech, we see different backgrounds and perspectives as essential to learning, discovery, and creation. We strive to remove barriers to student success and to build a welcoming community where everyone has the opportunity to contribute to our mission. As outlined in our strategic plan, we want to create an environment of holistic learning where all individuals can grow and learn to lead healthy, purposeful, impactful lives.

SoA & College of Design Policies

Archiving

At the end of the semester, all students are required to submit physical and/or digital examples of their work to their instructors or administration for archiving no later than one week after the end of term. By enrolling, each student grants a license to reproduce and display their work online, in forthcoming print publications, and in public exhibitions.

Ownership

For the purposes of continuous improvement efforts, such as accreditations and periodic program reviews, the School will select samples of student work submitted to satisfy course requirements. This includes digital files, papers, drawings, models, etc. Collected samples may be returned to students upon request.

College of Design Facility Rules and Guidelines

Please consult the Georgia Tech Student Handbook regarding the use of facilities and all Institute policies. Aerosol sprays of any kind are strictly banned from the studio and surrounding

areas. A spray painting booth is available in the College of Design shop on the ground floor of the East Architecture Building.

Course Expectations & Guidelines

Per the GT Catalog, all work produced in the College of Design as part of a degree program becomes the property of the College; it may be retained or returned at the discretion of the faculty. The faculty of the School of Architecture reserves the right to refuse credit for any project executed outside the precincts of the College or produced without proper coordination with the faculty.

Emergencies

In case of emergency (e.g., fire, accident, or criminal act), please call the Georgia Tech Police at 404-894-2500. Perry Minyard, IT Support Administrator for the College of Design, is also a firefighter and EMT certified in performing CPR.