ARCH 6512 Syllabus

Research Colloquium: Conduct of Architectural Inquiry, 3 Credits

Fall 2026

Prerequisites: Graduate Standing or Senior

Instructor Information

Instructor: Hui Cai, Ph.D. Professor

Email: hui.cai@gatech.edu

General Course Information

Description

Introduces students to the disciplines producing explicit knowledge in architecture, and to the general principles by which such knowledge is organized and prepared for use.

Course Overview

The course is designed to introduce students to fundamentals of research in architecture. It will provide a platform for exchange and dialogue between members of the research community within the School of Architecture.

This course is also suitable for students in Ph.D. or M. Arch degree programs who are interested in learning the landscape of architecture research, how to conduct research to support design thinking and innovation, and how to collect, analyze, and present data to a wide range of audiences. No prior knowledge of concepts or research experience is expected of the students.

Course Objectives

This course is designed to accomplish the following objectives:

1. To introduce students to the role of research in design, and a variety of knowledge domains within architecture research, including history and theory, design computation, high-performance building, design & health, advanced production, building information systems, and urban design.
2. To increase awareness of academic ethics, share information about common resources and tools that scholars use to support research development and

management.

3. To help students get familiar with common research design and research methods in architecture, especially in their areas of focus.
4. To develop students' data literacy and ability to collect, analyze, and communicate data effectively.
5. To foster intellectual curiosity and ability to work within their domain and cross different disciplines.

Course Learning Outcomes

Those students who successfully complete the course will:

1. Become aware of the problems in inquiry, the varieties of knowledge produced by them
2. Understand the logic of scientific communications
3. Acquire basic practical literacy in organizing information into formats that allow it to be treated as data

Required Course Materials

The texts are mainly to be used as background knowledge and further in-depth reading; specific texts will be identified during the course to be read for class discussions. Links or PDFs of selected chapters from each book or articles will be shared with students prior to class. Additional articles might be provided by guest lecturers.

Architecture Research Discourse and Methods

- Abusaada, H., Vellguth, C., & Elshater, A. (Eds.). (2019). *Handbook of research on digital research methods and architectural tools in urban planning and design*. IGI Global.
- Aksamija, A. (2021). *Research methods for the architectural profession*. Routledge.
- Gifford, R. (2016). EULA. In *Research Methods for Environmental Psychology*. John Wiley & Sons, Incorporated.
- Lucas, R., & Lucas, R. (2016). *Research methods for architecture*. Laurence King Publishing.
- Niezabitowska, E. D. (2018). *Research methods and techniques in architecture*. Routledge.
- Wang, D., & Groat, L. N. (2013). *Architectural research methods / David Wang, Linda N. Groat* (Second Edition.). Wiley.

Data Visualization and Visual Research Methods

- Troiani, I., & Ewing, S. (2021). *Visual research methods in architecture /* (I. Troiani & S. Ewing, Eds.; 1st ed.). Intellect Ltd. DeVellis.
- Evergreen, S. D. (2019). *Effective data visualization: The right chart for the right data*. SAGE publications.

Research in Practice

- Rust, C., Mottram, J., & Till, J. (2007). Review of practice-led research in art, design & architecture.
- Haymaker, J., Aksamija, A., & Green, D. (2016). Perkins+ Will: Research mechanisms and projects at Perkins+ Will. In *The Changing Shape of Practice* (pp. 14-24). Routledge.

Readings in Key Research Areas (Suggested by the Faculty Leads in Each Area)

Sonit Bafna

- Peponis, J., & Stansall, P. (1987). Spatial culture. *Designers's Jnl*, *27*, 52-56.
- Chambers, E. C., Bafna, S., & Machry, H. (2018). The association between apartment layout and depressive symptomology among Hispanic/Latino residents in low-Income housing: The AHOME study. *Journal of Urban Health*, *95*(1), 51-60.

Hui Cai

- Ulrich, R. S., Zimring, C., Zhu, X., DuBose, J., Seo, H. B., Choi, Y. S., ... & Joseph, A. (2008). A review of the research literature on evidence-based healthcare design. *HERD: Health Environments Research & Design Journal*, *1*(3), 61-125.
- Cai, H., Tyne, I. A., Spreckelmeyer, K., & Williams, J. (2021). Impact of visibility and accessibility on healthcare workers' hand-hygiene behavior: a comparative case study of two nursing units in an academic medical center. *HERD: Health Environments Research & Design Journal*, *14*(2), 271-288.

Athanassios Economou

- Economou, A. (2025). Shape Machine: Shape-Based Search and Replace in CAD. In Shape Computation, Mathematics and the Built Environment 9, S. Kotsopoulos (ed.), Springer. https://doi.org/10.1007/978-3-031-81623-9_16
- Economou, A., Hong, TC.K. (2023). Back to the Drawing Board: Shape Calculations in Shape Machine. In: Gero, J.S. (eds) Design Computing and Cognition'22. DCC 2022. Springer, Cham. pp. 549-567 https://doi.org/10.1007/978-3-031-20418-0_33

Hyojin Kwon

- Abrons, E., & Fure, A. (2017). Postdigital materiality. In *Lineament: Material, Representation and the Physical Figure in Architectural Production* (pp. 185-195). Routledge.
- Kwon. (upcoming), *Transformative Pixels: Computational Color and Image Displacement in Generative and Representational Design,* eCAADe 2025,

Patrick Kastner

- de Wilde, P. (2023). Building performance simulation in the brave new world of artificial intelligence and digital twins: A systematic review. *Energy and Buildings*, *292*, 113171.

Danielle Willkens

- Merrill, E.M. and Giamarelos, S., 2019. From the Pantheon to the Anthropocene: Introducing Resilience in Architectural History. *Architectural Histories*, 7(1). DOI: http://doi.org/10.5334/ah.406
- Mileto, Camilla, and Fernando Vegas. "Preserving Heritage with Tomorrow's Technologies Trials, Errors, and Criteria." APT Bulletin: The Journal of Preservation Technology 48, no. 1 (2017): 32-39. https://www.jstor.org/stable/26291033

Grading Policy:

The assessment of students' performance will depend on their work for individual assignments, class participation, and their performance in the class exercises.
The relative weights of the assignments are indicated below.

General class participation, including participation in in-class discussions, short in-class exercises and presentations assigned (**20%**)

Attendance and in-class participation	10%
Short in-class exercises	10%

Assignment 1: Understanding the Landscape of your domain. (**25%**)

Assignment 2: Develop your research proposal and communicate to different audiences (**25%**)

Assignment 3: Conduct your research project and communicate to different audiences **(30%)**

Description of Graded Components

Grading criteria for the assignments will be explained in class.
Your final grade will be assigned as a letter grade according to the following scale:

A- to A+ work: (90-100%) This is outstanding work going above and beyond, bringing in new ideas, demonstration of creativity and depth, and making a real positive contribution.

B- to B+ work: (80-89%) This is good work utilizing resources given to complete assignment. This grade reflects that you have met the full requirements of the class, and that your project is developed to the point where evaluation can be made relative to the class's essential criteria. Your project demonstrates a reasonable degree of completeness, care, and insight.

C- to C+ work: (70-79%) This is acceptable work going through the motions and keeping up with requirements. A grade of "C" is a baseline passing grade.

D- And below: (60-69%) represents “unsatisfactory” work. This grade reflects that you have significant attendance problems, poor performance, failure to meet deadlines, non-fulfillment of the basic requirements of the class, and/or your project is not plausible, not making contributions. Learning is inconsequential.

F (below 60%)-Not passing/class must be repeated. Work and/or performance is inadequate. Learning is minimal or nonexistent.

Please respect **deadlines for all assignments**. Assignments should be posted in Canvas for timely review and comments. **Late submission of main assignments will not be accepted**. Try to work as early as possible to avoid last-minute rushes.

The grading rubric of each assignment can be found in the documents posted on Canvas describing each assignment in more detail.
All assignments must be completed in order to receive a passing grade in the class. No incompletes awarded without appropriate reason or without a prior meeting of the student and the instructor. Incompletes will be granted only under extraordinary circumstances.

Course Policies

Attendance and/or Participation

Active Participation at all class meetings is mandatory and crucial to the successful completion of the class. Absences will be excused only for medical or family emergencies, Institute-approved events, and religious holidays documented in writing. (According to a new policy, you must notify your instructor in writing during the first two weeks of the semester about any anticipated absences for religious holidays.) 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 our BS ARCH, MS, 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, 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.

Students are highly encouraged to submit any class absence verification that is required due to documented illness, hospitalizations, accidents, death in the family, family emergencies, and 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 on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

All persons in the classroom are expected to behave with courtesy towards others and in a way that does not interfere with the regular conduct of the class. Cell phones are to be turned off when students enter the classroom and should remain off for the duration of the class; laptop computers are to be used only for taking notes; and students should not engage in private conversations while the instructor or other students are speaking. Anyone not adhering to these basic courtesies will be asked to leave.

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 developed by the Center for Excellence in Teaching and Learning and Online Education at Georgia State University includes template syllabus statements for each of the Core IMPACTS areas 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 to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

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 articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Pre-Requisites

This class requires graduate standing.

Collaboration, Group Work, and Use of Generative AI

AI Use is Assignment Dependent

Use of Generative AI (such as Microsoft Copilot) in this course will vary from assignment to assignment. Some assignments may allow or even require Generative AI usage while other assignments may limit or entirely prohibit use of Generative AI. Please check the instruction on each assignment to determine what, if any, usage of Generative AI is allowed and/or required. Do not assume that because Generative AI was allowed for one assignment, it will be allowed on other assignments.

When allowed for usage on an assignment, 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
- How the AI output informed or shaped your final submission

Failure to follow assignment guidelines for Generative AI —including using Generative AI when it is not permitted or failing to disclose its use when it is—may be considered a violation of Georgia Tech's academic integrity policies. When in doubt, always consult your instructor before using Generative AI.

We treat AI-based assistance, such as ChatGPT and Copilot, the same way we treat collaboration with other people: you are welcome to talk about your ideas and work with other people, both inside and outside of class, as well as with AI-based assistants.

However, all work you submit must be your own. You should never include anything in your assignment that you did not write directly without proper citation. You need to use quotation marks for exact phrasing; both direct quotes and paraphrasing require citations (e.g., in-line citations or footnotes/endnotes, as specified by the instructor).

It's important to understand that including anything you did not write in your assignment without proper citation will be treated as a serious academic misconduct case. If you are unsure where the line is between collaborating with AI and copying AI, we recommend the following heuristics: Never hit "Copy" within your conversation with an AI assistant. You can copy your own work into your original composition, but do not copy anything from the AI conversation directly back into your assignment. Instead, use your interaction with the AI assistant as a learning experience, then let your assignment reflect your improved understanding.

This heuristic avoids directly integrating AI into your composition environment: just as you should not let a classmate write content or code directly in your submission, you should also avoid using tools that directly add content to your submission.

Also, remember that overreliance on AI tools can significantly impact the development of fundamental skills. Additionally, AI environments contain mistakes and ingrained biases that can misrepresent your ideas, intentions, and the demonstration of learning objectives.

All graphic content created with AI tools should be labeled as AI-generated or AI-assisted. Experimentation with various AI tools is highly encouraged, but needs to be clearly identified.

Extensions, Late Assignments, & Re-Scheduled/Missed Exams

Assignments and presentations are due on the dates specified in the syllabus. Late submissions and/or absences from formal presentations are only admissible under extraordinary circumstances or if in conflict with official Institute events. Please notify the instructor in advance of a potential conflict or at the earliest opportunity should such circumstances arise.

Additional Course 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.

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 also reserves the right to refuse credit for any project executed outside the precincts of the College or otherwise produced without proper coordination with the faculty.

Campus Resources for Students

Graduate Student Academic and Professional Success Resources:

A list of resources for graduate students is given on the Office of Graduate and Postdoctoral Education website. Specific information for current graduate students includes

- Academic Resources such as the Communications Center, Language Institute, Library, Catalog, Registrar, resources for conducting research, Advocacy and Conflict Resolution resources, and how to manage unexpected situations that may impact your academic performance;
- Student Resources such as Campus Services, Child Care/Family programs, Health & Wellness, Career Services, and the Student Resource Guide; and
- *Professional Development such as the programming from the Career Center and other professional development resources and events"*

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 and maintained by the Office of the Vice President for Student Engagement and Well-being (student-resource-guide (gatech.edu)

Library & Archives

Need to do research but don't know where to start? 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 website: https://library.gatech.edu/

Georgia Tech Archives website: http://library.gatech.edu/archives

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.

Emergencies

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