

CP8900 Special Topics (Urban Systems Design)

Spring 2027

Instructor Information

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Course Description

Urban planners and architects tend to design cities as frozen in time. Yet cities are perceived environments, experienced through dynamic processes across complex urban systems. Human perception of cities is now further augmented by AI-driven data analytics and sensor networks that fuse digital and physical experience in real time. These changes point to three interconnected propositions: recognizing that urban perception is already digitally augmented; translating high-frequency sensing into slower, place-based design interventions; and democratizing the data analytics and governance through community decision-making. This Special Problem will explore a district-scale, design-led, multi-stakeholder pathway toward urban digital twins that provide a transformative approach to shaping future communities.

Course Format and Structure

- Midterm – 6 page in writing, including research questions and research design
- Final – an original term paper, including research experiments, findings and arguments.

References

1. Batty, Michael, 2018, Chapter 7: The Sixth Kondratieff: The Age of the Smart City, in *Inventing Future Cities*, MIT Press.
2. Batty, Michael, 2024, *The Computable City*, MIT Press.
3. Yamagata, Y. & Yang, P. P.-J. (eds) *Urban Systems Design: Creating Sustainable Smart Cities in the Internet of Things Era* (Elsevier, 2020).
4. Yang, P. P.-J. & Yamagata, Y. Urban systems design: from “science for design” to “design in science.” *Environ. Plan. B Urban Anal. City Sci.* 46, 1381–1386 (2019).

Institutional and Administrative Policies

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. For information on Georgia Tech's Academic Honor Code, please visit the

[Georgia Tech Academic Honor Code](#). Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, which will investigate the incident and can impose academic sanctions.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (ODS) at (404) 894-2563 or visit them at Smithgall Student Services Building, Suite 2-230. Once you have your accommodation letter, please meet privately with the instructor to discuss the accommodations that have been requested. For more information, visit

[Georgia Tech Office of Disability Services](#).

Student-Faculty Expectations

Georgia Tech expects a quality experience for both students and faculty. Students can expect that the instructor will be professional, prepared, and provide feedback in a timely manner. The instructor expects students to be prepared, to participate in class activities, and to uphold the standards of the Georgia Tech community. Communication between students and instructor should be professional, respectful, and timely. For the full statement on student-faculty expectations, see the

[Student-Faculty Expectations Agreement](#).

Generative AI Use Policy

Students may use generative AI tools (such as ChatGPT, Copilot, or similar) only for tasks explicitly approved by the instructor. Undisclosed use of AI-generated content submitted as your own work may be treated as an academic integrity violation. When AI tools are approved for use, students must document their use clearly in submitted work. The goal of this course is to develop your own analytical and design capabilities; AI tools may support, but should not replace, your own reasoning and judgment.

Institute Approved Absences

Georgia Tech recognizes certain types of excused absences, including absences for Institute-approved activities, military service, and serious illness. Students who anticipate missing class for Institute-approved activities should notify the instructor at least one week in advance and provide documentation. Students are responsible for any material missed during an absence. See the

[Georgia Tech Academic Regulations on Attendance](#) for full details.