

1. Subject number and title

4.566 Advanced Projects in Digital Media

2. Date(s) offered

2026 Fall Semesters

3. Credits

2-0-4, 2-0-7 or 2-0-10 Units

4. Type of subject (lecture, seminar, studio, workshop, lab)

Individual tutoring and group seminar

5. Instructor(s)

Takehiko Nagakura

6. Prerequisites if any

4.562, 4.564 or permission of the instructor upon review of project proposal

7. Subject overview/description

This course provides opportunities for a student to develop an individual research project with a topic related to digital design media. The primary audience is students who have already acquired a basic technology foundation in advanced design software or graphics programming languages through previous classes at MIT. The class provides no structured instruction in any particular software, hardware, or programming language. A student in a research degree program in architecture can use this course to start up a pilot research project prior to his or her thesis semester, or towards writing some academic research paper. A student may take this class repeatedly for credit to develop different projects.

The class expects from each student a self-driven exploratory process at a steady pace while working closely with the instructor and under his supervisory guidance. A student must declare a clear frame of a research project at the beginning of the semester upon consultation with the instructor. After a few weekly meetings for each student to shape the project details, there will be bi-weekly individual critique sessions to help each student advance the research project. At mid-term and the end of the semester, review sessions will be held with the entire class to share the progress and outcome.

Contingently, occasional short presentations may be scheduled for the instructor or guest speakers to introduce a variety of research projects and different approaches to solutions.

Potential areas of student research topics include:

- a. Software-based design tool development (for design/construction process, facility management, real estate, education, etc.)
- b. Design knowledge representation and its digital implementation (example: development of a Shape Grammar, designing parametric BIM components, or training/adapting an AI model for spatial design context)

- c. Advanced digital design/visualization content creation (example: computer graphics video, animation, stereo-graphics visualization, panoramic imaging, and other 3D/interactive production in game engines)
- d. Application of emerging design/visualization tools (example: Generative AI, Gaussian Splatting)
- e. Development of interactive system for design and presentation (example: augmented reality/HMD/mobile application, location specific installation, on-site data collection tool)
- f. Study of human behaviors or affective computing in the context of spatial design (example: human subject experiment, video analysis, data mining from on-line resource and big data)
- g. Social computing about built environment, design communication/distribution methods (example: sentiment analysis, gamified study, 3D video streaming)
- h. Other topics related to the use of digital technology in architectural design

8. Schedule of topics, tests, and due dates for major assignments (subject to change)

** Due to a recent injury of the instructor, 2026 class will be conducted largely through desk critics held remotely on Zoom, until the instructor recovers and becomes able to commute to the campus.*

Week 1: Introduction

Week 2: Students meet individually with the instructor to discuss initial project proposal

Week 3: Student Project Framework Finalized

Week 4: Individual Critic (sign-up sheet available)

Week 5: Individual Critic (sign-up sheet available)

Week 6: Individual Critic (sign-up sheet available)

Week 7: Individual Critic (sign-up sheet available)

Week 8: Individual Critic (sign-up sheet available)

Week 9: Student Presentation - Mid-term Review

Week 10: Individual Critic (sign-up sheet available)

Week 11: Individual Critic (sign-up sheet available)

Week 12: Guest Speaker/Seminar (TBA)

Week 13: Individual Critic (sign-up sheet available)

Week 14: Student Presentation - Final Review (with guest critics)

9. Learning objectives

See the overview above.

10. Reading Assignments

No default list. Readings are suggested to suite each individual student project.

11. Completion requirements and grading criteria

Each student is required to make presentations (proposal, mid-review and final review) of his or her project and participate in the discussions during the group sessions. At the end of the semester, an online page is required to be set up in the form of an instructor

provided template, and to be filled with graphics to illustrate the project with summary text. Please see the class home page for examples from previous years.

<https://cat2.mit.edu/4.566>

Grades are based on the project's conceptual level of exploration, technical finesse, completeness, craftsmanship and aesthetic quality as well as participation to the class. There is no examination.

Project Development (75%) + Desk Crits/Class Presentations (15%) + On-line Project Description (10%)