GSND 6460: Generative Game Design
Spring 2025 Syllabus

Course website: https://www.khoury.northeastern.edu/~cmartens/Courses/ggd-s25/index.html

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MEETING COORDINATES

Wednesdays and Fridays
11:45am - 1:25pm
Ryder Hall 431

COURSE DESCRIPTION AND OBJECTIVES

This course covers principles of procedural content generation and generative methods, including modular design, the role of randomness in design, and designing for emergence. We examine the role of generative design in games and its impact on both designers and players.

PREREQUISITES

No formal prerequisites. Background knowledge in any/all of the following subjects will help with keeping pace with course expectations:

- General programming (especially Javascript or p5.js or Processing)
- Data structures and algorithms
- Formal languages and automata
- Game design and game prototyping (especially analog/pencil-and-paper design)
- A creative practice such as painting, sculpture, textiles, or 3d modeling.

EXPECTED LEARNING OUTCOMES

Upon successful completion of this course, all students should be able to:

- Explain the concept of a possibility space and how a computer program can represent one.
- Explain the concept of generative (or variational) design and how it relates to possibility spaces.
- Develop small programs ("sketches") that demonstrate generative design techniques.
- Use event handlers, loops, recursion, variables, and randomness in programs.

- Select and use data structures such as arrays, dictionaries, trees, graphs, and grids when appropriate, and write algorithms that traverse and manipulate these structures.
- Use finite-choice logic programming to represent possibility spaces and decision-making procedures.
- Use production grammars, cellular automata, and rewrite rules to produce design variations.
- Identify abstraction boundaries in generative design problems, choose programmatic representations at the appropriate level, and write programs that translate between different representations.
- Analyze games and identify generative elements in the design as well as places where generative elements could be applied.
- Describe the evolution of procedural content generation and the interplay of those techniques across analog and digital mediums.
- Interpret open-ended creative prompts and deliver prototype implementations on a short time frame.
- Critique creative work, and have their creative work critiqued, by and for their peers.
- Prototype a game that embodies a generative process.

COURSE MATERIAL

The course website (linked at the top of this document) is the primary hub of all information relevant to the course. Students are encouraged to check there before asking questions.

Required communication tools:
- Piazza for course communication
- Gradescope for homework submission

Other resources will be made available on the course website:
- Lecture slides and notes
- Code developed in class
- Citations and links to textbooks, videos, and online learning materials for further reading

Required Texts

There is no required textbook for this class. All relevant materials will be shared in class notes and/or supplemental readings explicitly mentioned by the instructor.

Recommended Texts

Procedural Content Generation in Games
Available online at https://www.pcgbook.com/

ISBN-13: 978-3319427140
ISBN-10: 3319427148

Procedural Generation in Game Design

ISBN-10 : 1498799191
ISBN-13 : 978-1498799195

Procedural Storytelling in Game Design

ISBN-13: 978-1138595309
ISBN-10: 1138595306

Pattern Language for Game Design

ISBN-13: 978-0367367725
ISBN-10: 0367367726

Readings will also be pulled from a variety of sources and posted as PDFs or web links to the class website.

Students will be expected to play and critique games as part of the course; games are chosen to be either free and available for multiple platforms via digital distribution, or available to play in on-campus labs.

GRADING CRITERIA

Weekly sketches	15%
Design reflections	15%
Team project	30%
Classroom community	20%

Student progress is approximated by the above formula, which accounts for individual work done primarily outside of class (weekly sketches and design reflections), a team project in the second half of the semester with weekly playtesting sessions in class, and “classroom community”, which encompasses multiple dimensions of being a good community member towards one’s peers: showing up to class; speaking and listening attentively in discussions; commenting on peers’ work on Piazza; providing helpful and constructive feedback during playtesting days; exhibiting good teamwork within peer collaborations; and contributing to the

shared project of creating a community of vibrant, kind curiosity where everyone can do their best creative work.

The specifics of each of these criteria, including assignments and final project guidelines, will be posted on the website, along with a schedule of topics and deadlines. While this syllabus is expected to stay fixed throughout the semester, the course schedule, including assignments and their deadlines, readings, and lecture topics, is subject to change.

ATTENDANCE POLICY

Most “lectures” will actually be highly participatory and interactive; accordingly, we will sometimes refer to them as “class meetings” rather than lectures. There is also no textbook for the course; although lecture notes will be published, they are meant to serve as *supplementary* to lectures rather than as a replacement for them. As such, synchronous, in-person attendance is strongly encouraged. Course participation is about more than merely showing up. Students are expected to actively and productively engage in discussions and activities.

That said, your health and well-being should always take priority. If you feel any symptoms of transmissible illness, or if coming to class would cause undue hardship for you, please stay home. Request the lecture recording from the instructor and arrange a way for you to make up for the “participation” component, such as posting a discussion point or response to an exercise on Piazza.

MIDSEMESTER AND FINAL REFLECTIONS

All students are required to submit, in lieu of a midterm and final exam, a reflection on the course and self-evaluation of their progress towards the learning objectives, by answering a series of questions provided by the instructor. Each student will have the opportunity to report their expected grade, describe any unforeseen circumstances affecting their performance, report ways they have engaged with the course material that were not otherwise visible to the instructor, ask for help, and give feedback to the instructor about the course itself.

These reflections are required, and in some cases can be used to recover credit for incomplete work. Failure to submit either one of these reflections will result in failure of the course.

CLASSROOM POLICIES

Attribution for Creative Work

If not otherwise stated, all work for individual assignments is assumed to be carried out solely by the individual student; and for team assignments, solely by the members of the team. Students will, however, be expected to use code, libraries, frameworks, and assets developed by other parties (such as p5js) (and at their option, other tools like Unity and its free libraries and assets).

However, **all creative work must be correctly attributed**. *Attribution* means including a statement that links a person to the work that they created: give their name, describe what they contributed that you used, and provide other relevant information, such as the year of creation and the place you retrieved it from. We may use the term *citation* to refer to the same practice and policy (as in: all works must be properly cited).

Text, images, code, and other output generated by closed-dataset models like ChatGPT, GitHub CoPilot, and Midjourney, is *not permitted to appear* in student work, because it is not possible to attribute the creative labor that produced the training data for these tools. Students may use these tools as part of their creative process, but the output of those tools is not permitted to appear in submitted work. Students *may* use machine learning if they use their own work, or a properly-attributed open dataset, as the training data; in either case, they must clearly and correctly identify the training dataset and list by name all authors/creators whose work is included in it.

Failure to correctly attribute others' creative work will constitute plagiarism and/or academic dishonesty, and will result in appropriate penalties depending on the severity and recurrence of the behavior.

UNIVERSITY POLICIES

End-of-Course Evaluation Surveys

Your feedback regarding your educational experience in this class is very important to the College of Professional Studies. Your comments will make a difference in the future planning and presentation of our curriculum.

At the end of this course, please take the time to complete the evaluation survey at https://neu.evaluationkit.com . Your survey responses are completely anonymous and confidential. For courses 6 weeks in length or shorter, surveys will be open one week prior to the end of the courses; for courses greater than 6 weeks in length, surveys will be open for two weeks. An email will be sent to your HuskyMail account notifying you when surveys are available.

Academic Integrity

A commitment to the principles of academic integrity is essential to the mission of Northeastern University. The promotion of independent and original scholarship ensures that students derive the most from their educational experience and their pursuit of knowledge. Academic dishonesty violates the most fundamental values of an intellectual community and undermines the achievements of the entire University.

As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and

restrictions regarding research and writing, examinations of whatever kind, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Students are responsible for learning the conventions of documentation and acknowledgment of sources in their fields. Northeastern University expects students to complete all examinations, tests, papers, creative projects, and assignments of any kind according to the highest ethical standards, as set forth either explicitly or implicitly in this Code or by the direction of instructors.

Go to http://www.northeastern.edu/osccr/academic-integrity-policy/ to access the full academic integrity policy.

Student Accommodations

Northeastern University and the Disability Resource Center (DRC) are committed to providing disability services that enable students who qualify under Section 504 of the Rehabilitation Act and the Americans with Disabilities Act Amendments Act (ADAAA) to participate fully in the activities of the university. To receive accommodations through the DRC, students must provide appropriate documentation that demonstrates a current substantially limiting disability.

For more information, visit http://www.northeastern.edu/drc/getting-started-with-the-drc/

Student Well-Being

All students have access to We Care
– 617-373-7591
– wecare@northeastern.edu
for health concerns, referrals for mental health and assistance with leaves of absence.

Additionally we have FIND@ Northeastern - Available 24/7/365
– 1-877-233-9477 (domestic)
– 1-781-457-7777 (international)
– https://www.northeastern.edu/uhcs/find-at-northeastern/

Library Services

The Northeastern University Library is at the hub of campus intellectual life. Resources include over 900,000 print volumes, 206,500 e-books, and 70,225 electronic journals.

For more information and for Education specific resources, visit
http://subjectguides.lib.neu.edu/edresearch