DA250: INTERACTIVE & ALGORITHMIC ART

FALL 2023

INSTRUCTOR — Nic Aguirre — naguirre@clarkson.edu
OFFICE HOURS — Wed 3:00p – 4:00p @ 164 Snell Hall

CLASS LOCATION — CEC: 130 Snell Hall
SECTIONS
DA 250-01 (9349) — Meets Mon/Wed 9:00a – 10:50a

Description

Students in this course apply creative and technical rigor to produce 2D and 3D interactive, computer-generated artwork.

Objectives

Students who complete this course will:

- Understand and apply object-oriented programming (functions, variables, arrays, control flow, iteration, objects)
- Understand and apply principles of graphic design (color, proportion, rhythm)
- Learn to navigate and use technical documentation to resolve issues
- Create several attractive portfolio pieces
- Gain familiarity of procedural algorithms (e.g., Perlin noise)
- Understand, apply, and visualize algorithms (e.g. random number generation)
- Create procedurally-generated graphics and other assets
- Learn tools for rendering in both 2D and 3D
- Represent real-world models (e.g., physics, gravity) programmatically

Audience

This course is designed to target a broad audience across disciplines. It makes programming

more approachable to the non-programmer. It gives creative faculty to students of a technical background.

This course gives students **creative freedom** to express ideas, concepts, thoughts, and feelings through digital media. My goal is always to demystify technical hurdles so that students can fulfill their purpose without feeling intimidated by code and complicated tools.

Having a relatively small class size will give students more freedom in their pursuit of a satisfying vision.

Structure

The first unit of this course is more rigid and structured, and the second unit is more open-ended and free-form.

Unit One: 2D (p5.js)

In this unit, students will use p5.js, a JavaScript library, to learn the basics of object-oriented programming. Students will create artwork that is dynamic, interactive, and procedurally-generated. Artwork in this unit will be abstract and exploratory.

Unit Two: 3D (Houdini)

In this unit, students will use Houdini (and other tools if desired) to create 3D graphics. Having developed an understanding of how procedural generation works, students can use tools to automate the process.

Work

Use of Class Time

This class is project-driven, and demands consistent effort inside and outside of the classroom. Classes are intended to be variable and may feature lectures, tutorials, in-class exercises, discussions and lab time. An effort is made to create a more interactive and less passive experience for students.

Projects (60 pts.)

This class features four large-scale projects.

- Project 1 (10 pts.) — students demonstrate understanding of programming principles with p5.js
- Project 2 (15 pts.) — students create dynamic and interactive artwork with p5.js.
- Project 3 (15 pts.) — students gain familiarity with Houdini
- Project 4 (20 pts.) — students integrate all of their knowledge from the semester into a culminating final project of their choice.

Homework (25 pts.)

This class has homework assignments designed to test and reinforce knowledge from class. Homework assignments typically involve a shorter or less involved coding task.

Quizzes and Participation (10 pts.)

A quiz consists of either (a) an unannounced quiz or (b) an in-class lab activity. Quizzes are designed to ensure that students are completing their readings, preparing properly, and following along with in-class coding activities.

Participation is an important element of this class. Being present (physically and mentally) will give you a better experience.

Many of our classes will focus on the completion of certain exercises, tutorials, and discussions. Most class days will feature a small participation exercise. They are to be finished during class and are generally graded on completion.

Students **must be physically present** to claim a participation assignment. Coming to class late, leaving early, or attempting to submit participation while not present are all grounds for losing points.

Professionalism (5 pts.)

Students are expected to behave like adults. Unprofessional behavior will be met with a grade deduction in this category.

Unprofessional behavior includes (but is not limited to):

- Arriving to class late
- Leaving class early
- Failure to observe course policies
- Disrespect towards classmates or instructor
- Lack of consideration for classmates or instructor

- Distracting behavior
- Failure to practice academic integrity
- Excessive use of cell phone during class

Final

There is no final exam for this class; you will present a final project instead.

Grading

Points

There are a total of **100** points in this class. The grade is divided as follows:

Assignment	**Points**
Project 1	10
Project 2	15
Project 3	15
Project 4	20
Homeworks	25
Quizzes/Participation	10
Professionalism	5
Total	**100**

Course Grade

Your grade will be assigned as follows:

Grade	Range
A+	100% to 97.0%
A	< 97.0% to 93.0%
A-	< 93.0% to 90.0%
B+	< 90.0% to 87.0%
B	< 87.0% to 83.0%
B-	< 83.0% to 80.0%
C+	< 80.0% to 77.0%
C	< 77.0% to 73.0%
C-	< 73.0% to 70.0%
D+	< 70.0% to 67.0%
D	< 67.0% to 63.0%
D-	< 63.0% to 60.0%
F	< 60.0% to 0.0%

Grading criteria will be given for each individual assignment.

Revisions

When software is created in a professional environment, changes and revisions are common. Factoring that software development is an iterative process, students are **sometimes** allowed to revise and resubmit assignments. Re-submitting work is a **privilege** granted at the instructor's discretion.

If you are re-submitting work:

1. You must have submitted the work by its due date. Late work is not eligible for re-

submission.
2. The privilege to revise submitted work is only available for students who submitted substantial work; incomplete or dysfunctional code is not eligible for resubmission. This is at the instructor's discretion.
3. You may only recover partial points lost.

Required Materials

Software

Software is a focal point of this course, and an effort was made to ensure that free, cross-platform software will be used wherever possible.

We will use:

1. p5.js
2. Houdini Apprentice

Other requirements:

1. Computer System & Software Requirements
2. Software Accessibility Policies in General
3. Software Privacy Policies in General
4. Contact Helpdesk

Minimum Technology Skills

1. Use a learning management system
2. Use e-mail with attachments
3. Create and submit files in commonly used word processing formats
4. Copy and paste
5. Download and install software

Digital Information Literacy Skills
Find help at the Clarkson Library website

Hardware

We will be rendering 3D graphics. You need access to a high-performance PC.

Policies

Attendance

Students should make a serious effort to attend every lecture. While attendance is not taken, I believe **attendance is the strongest guarantor of success** in this course.

Course material is cumulative in nature and class periods are used to develop skills and work on projects. You will also miss out on quizzes and participation activities if you miss class.

Deadlines

Deadlines are strict and non-negotiable. Late assignments will be accepted for the first three calendar days after a deadline. I will remove 15% for each day past the deadline (Example— If you got 85 on an assignment but submitted it two days late, you're getting a 55).

Assignments may not be submitted after three calendar days have elapsed (Example— Deadline is September 8th, you cannot submit after September 11th)

The only **exception to this rule** is the final project, which cannot be submitted late.

Absences

Whether or not an absence is excused is **entirely at the discretion of the instructor**.

If you miss a quiz or participation exercise and have an **excused absence**, you have **one week** to make up that assignment at office hours. If you cannot attend scheduled office hours, it is your responsibility to reach out and schedule another meeting time.

If you know you are going to be absent or late on a certain day, please tell me ahead of time.

Lost Data

You are responsible for keeping backups/duplicates of your files. You can use Google Drive or GitHub to maintain copies of your files. Losing your files is not an excuse for late or incomplete work.

Email

When you e-mail me, **your subject line should include the course number and section** e.g.–

"[DA250 MW 9:00am]"

Example of a poor email subject line: "its not working"

Example of a good email subject line: "[DA250 MW 9:00am] Running a local server for p5.js"

If you need help with a project, you need to give me a way to access these files (e.g., GitHub repo, shareable Codepen or Google Drive link)

It can be difficult to diagnose coding problems via e-mail. I'll do my best, but you should consider talking with me after class, or coming to office hours if you're struggling with an assignment.

I will do my best to correct code over the e-mail, but students should not expect me to correct **more than three lines of code in an e-mail**.

Students should know that an e-mail response may take **up to 72 hours** depending on the time of the semester.

Food and Drink in Class

Sorry, they are not permitted.

Academic Integrity

Academic Integrity, based on the values of honesty, trust, fairness, respect, and responsibility, is a fundamental principle of scholarship in higher education. Clarkson's Academic Integrity Policy prohibits: plagiarism (using another person's writing or copying any work without proper citation), falsification, unauthorized collaboration during a test or on an assignment, or substitution for another student to take an exam, course or test, and other forms of academic dishonesty.

If you are to benefit from this class and be properly evaluated for your contributions, it is important for you to be familiar with and follow Clarkson University's Academic Integrity policy. Please review this policy online (Undergraduate section IV – Academic Integrity, Graduate section IV – Academic Integrity). Work that violates this policy will not be tolerated. Students who are found responsible for a violation of the Academic Integrity Policy will have both a university process sanction and an academic outcome, that could include a failing grade on the assignment or exam, or a failing grade for the course.

Proper Attribution for Referenced Works

By nature, code is re-usable and extensible. It is both acceptable and encouraged to utilize and

adapt examples of code; this is common on websites like StackOverflow. However, the sources for all referenced code must be given in your code commenting. I will assist students with finding code that is reusable (such as under the GNU license), and help with giving proper credit to the source.

Stealing code

Students may not share code samples with one another. If you are using code that you didn't write, without giving credit, you are cheating.

Students with code that is identical or very similar (more than 75% the same) are subject to losing points, or a failing grade.

Using assets

Sometimes you'll want to use pre-existing assets— 3D models, brushes, icons, scripts etc.

This is permitted as long as you:

1. Get my permission to use it in your project
2. Make sure that the assets are available for re-use (check the license!)
3. Make sure the creator is aware that their assets are being used

Generative AI

You can use generative AI.

However, there are several reasons you should approach it with caution:

1. Excessive use inhibits your ability to learn and memorize code patterns independently
2. It can stifle human creativity
3. It is still prone to errors
4. It doesn't fully understand the context in which it is generating content

It is not acceptable to have a substantial amount of your code written by AI.

Please refer to Clarkson Library's Guide to Plagiarism and the guide to Citing Sources for assistance on avoiding plagiarism and properly citing sources.

Students with Disabilities Requesting Accommodation(s)

The University strives to make all facilities and programs accessible to students with permanent,

ongoing, and temporary disabilities by providing appropriate and reasonable academic accommodations, as necessary. Disabilities that may benefit from reasonable accommodations include, but are not limited to, broken wrist, ADHD, surgery recovery, Learning Disability, concussion, visual impairment, etc. For more information and/or to request accommodations, contact the Office of Accessibility Services at oas@clarkson.edu or 315-268-7643.

Students with Disabilities Policy

Office of Accessibility Services Website

Other Policies of Note

Discrimination & Harassment

Religious Accommodations

Syllabus

This course is rich in content and skill levels vary widely among students. The instructor reserves the right to amend this syllabus to better match the needs of a given class.

Final Grade

The instructor reserves the right to adjust your final grade based on effort, participation, or conduct. This is uncommon.