

Introduction to Computer Game Design

COMP 1501 A

Winter 2024

Course Outline

Instructor:	Connor Hillen (He/Him)	Lecture Hours:	Wed. Fri. 11:35AM-12:55 PM EST
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Office Hours:	Available on Brightspace	Location:	Online: Zoom link on Brightspace

Carleton University acknowledges the location of its campus on the traditional, unceded territories of the Algonquin nation.

1. About the Course

Calendar Description: Introduction to game design and prototyping. Topics include: formal theories of fun; the mechanics-dynamics-aesthetics framework; game economies; game balance; statistical tools for analysing game mechanics; game settings; and storytelling. Special attention is given to the attributes of games and what makes a game fun.

Prerequisite(s): One of COMP 1405, COMP 1005

Textbooks and Other Resources: The following textbooks are recommended, but not strictly required. Specific editions are not important, but reading references will be based on this. All readings are optional but will help significantly with the course and your future career in game development.

Note: All the below books are also available as free e-books through Carleton's O'Reilly portal available here: <https://library.carleton.ca/node/16228> - there may be some restrictions on availability.

- (Highly Suggested) Tracy Fullerton, Game Design Workshop, 3rd Edition, 2014
A practical overview of the process of brainstorming, designing, creating, and releasing games
- (Suggested) Jesse Schell, The Art of Game Design: A Book of Lenses, 3rd Edition, 2019
A game design theory book with hundreds of practical questions to help examine your game and improve it over time. Most valuable after some experience practically creating games.

Additional resources will be made available on the course web page. These include a course calendar, additional readings, supplemental videos, links to the class Discord server (**required**), and more.

Objectives: The goal of this course is to introduce you to the fundamentals of game design and enable you to intentionally design and develop gameplay experiences. By engaging in all the course content, you should be able to brainstorm a game concept, design the game and discuss the formal elements of game design, incrementally improve the game over time using playtesting, analyse a game design's target demographic and balance, and develop both tabletop games and digital games using the Godot Game Engine. Additionally, you will get extensive experience working in teams in design and programming environments.

Topics Covered: A detailed list of prospective topics is available on the course web page. We begin by learning design fundamentals, applying this in tabletop games and playtesting with peers, learn to work as a team, then wrap up by developing a game in the Godot Game Engine. Below is a list of topics we'll cover, and what a student that completes all coursework should be able to do with it:

- **Godot Game Engine:** Implement simple computer game prototypes using the Godot Game Engine and GDScript, a Python-like scripting language made for the engine,
- **Build Your Game Vocabulary:** Define a game and describe the different types of games,
- **Demonstrate an Understanding of Game Decomposition, Including:**
 - The game loop, MDA Framework,
 - The taxonomy of fun
 - Artificial intelligence in games, finite state machines,
 - Probability, combinatorics for games,
 - Narrative structures in games, including the hero's journey, worldbuilding,
- Explain the **principles of game design** and the **incremental process** involved in designing games,
- Apply **introductory knowledge of game project management** to plan a project and communicate effectively in team settings.

Please note that you are expected to learn much of the Godot game engine on your own before the final project, and should take the time to review the official guides and try out the tutorials before the winter break: <https://docs.godotengine.org/en/4.2/index.html>

Technology: For this class, we will be using two major pieces of software:

1. [PlayingCards.io](https://playingcards.io): A free, web-based system for creating tabletop games that can be shared in the browser. You will be using this for your first 4 assignments beginning on Week 2, and you are **strongly** encouraged to review the documentation before your first tutorial: <https://playingcards.io/docs/>
2. For this class, we will be using the [Godot Game Engine](#), specifically **Version 4.2.x** (e.g., 4.2.1, 4.2.2). The Godot Game Engine is free, lightweight, and open source. There are two major versions available currently: Godot 3.5.x LTS and Godot 4.2.x.

Godot 4 is a recent release, and as such as fewer resources available to learn from, but Godot 3 guides can be translated using the official [Upgrading Guide](#). Godot 4 has problems exporting to the web browser for Mac and iOS, and using a Windows or Linux machine is encouraged. Always verify your Godot version. While Godot supports many programming languages to code in, we will specifically be using **GDScript**, the Python-like language designed specifically for Godot.

You are **strongly** encouraged to begin experimenting in the Godot Game Engine as early as possible. Resources to support self-directed learning will be available on the course Brightspace.

2. Assessments

1. **5 Weekly Assignments:** Each week before reading week, you will be asked to design and test one game each week, with a given prompt. You will need to submit a one sheet instruction manual and answer a few short questions about the design process of each game. Teams are formed in advance on Brightspace. Tutorial attendance is **mandatory** to receive assignment marks.

The assignment prompts are as follows (subject to change):

- (Team A) Paper Prototyping: Design a game from a starting goal, test it, and provide instructions.
- (Team A) Radical Revision: Take the previous week's game, playtest it, find what's fun, and radically revise the game to emphasize the most fun parts.
- (Team B) Disruption: Take an existing game and radically disrupt one major aspect of it, then test how well the game works.
- (Team C) Experience Game: Given a target experience, design a game which gives the feeling of the target experience without purely simulating it.
- (Team C) Attempting Godot: Using either the Experience Game or a new game design based on a provided prompt, attempt to make a game in Godot. This assignment will be marked on completion, rather than fun, to experiment with different Godot features.

Assignments 1-4 are graded by **two TAs** playing your game and grading on a rubric of different elements of fun. A detailed rubric will be made available on Brightspace but expect to be assessed on topics such as clarity of instructions, choices of the player affecting outcomes in interesting ways, and clarity of goals.

Assignments have two submissions: A group submission which includes your game instructions, a playable version of your game, and for Assignments 2, 3, 4, notes about your playtest and possibly some group reflection questions. There is also an individual submission: A short survey peer evaluation quiz, graded based on completion.

Assignments are graded **best 4 out of 5**, but a **complete attempt must be made for each assignment** as detailed in the specification. Review the Accommodations section for information about making up missed tutorials, late assignments, and additional information on the Best 4 out of 5 policies.

1. **Final Project:** In the second half of the course, you will form a final team to pitch, design, and implement a game in the Godot Game Engine. Like the assignments, each week there are two submissions: A group milestone submission, which must meet the specified milestone requirements, and an individual peer evaluation. The final peer evaluation in Milestone 5 will be used to adjust final project marks. During the final project, tutorial attendance is marked based on prompt attendance and duration of stay in the tutorial to ensure consistent participation in groupwork activities.
2. **Side Quests:** A selection of "Side Quests" will be available on Brightspace. These are small tasks you can choose to complete, each rewarding a certain percentage for completing. There will be suggested side quests, but you are free to choose any you would like to fulfil these requirements. You may also propose side quests to the instructor if you feel there are fun related side projects you would like to engage in!
Important: 3% worth of your side quest grade is **due before the start of winter break**. There are recommended side quests to reach this 3% and additional details posted to Brightspace.

3. **Asynchronous Quizzes:** There are two fixed-duration quizzes within a 57-hour window on Brightspace: Quiz 1 begins Monday, Feb. 05 at 8:00AM EST and closes Wednesday, Feb. 07 at 5:00PM EST. Quiz 2 begins Monday, Mar. 18 at 8:00AM EST and closes Wednesday, Mar. 20 at 5:00PM EST. They must be completed individually. The first quiz covers design theory and game decomposition, and the second covers more technical skills.

Assignments (4x5%, best 4 of 5, see Assignments for restriction)	20%
Assignment Peer Evaluations (5x1%, Due Sundays following tutorials)	05%
Quizzes (Online Asynchronous, 2x10%, Feb. 05 and Mar. 18)	20%
Side Quests (Brightspace, up to 3% bonus)	10%
Project Milestones (5x3%, Due Sundays starting Mar. 10)	15%
Project Tutorial Attendance (5x1%, Weeks 8, 9, 10, 11, 13)	05%
Final Project (Due April 09, 11:59AM)	25%

Collaboration Policy: This course expects a lot of collaboration within teams and receiving playtest feedback from other students. You are not allowed to work on any other team's work, outside of providing playtest feedback. **You are required** to participate in all different disciplines of tasks involved in the course, as discussed in class. **If it is found through peer evaluations and progress reports that you did not partake in design, development, and playtesting by the end of the year, this is grounds for deductions at the instructor's discretion.**

The work that you produce for this course is expected to be original: Your designs must be original designs, worked on with your group. Your code must primarily be made by yourself and your group. In this course, collaboration and peer support is encouraged to support learning the technology and receiving feedback for design. In spirit: Do not share code specific to your game's design and do not use code which would govern the direction of your game's design. Any shared code should not be a deciding factor in an assessed component of your game's design.

If you are unsure of what is expected of you, or are unsure of what constitutes inappropriate collaboration, please *ask the instructor, and review the academic integrity information.* To further clarify:

- **You may use** a small snippet of code (e.g., <5 lines) from online sources or peers, but you **must** provide sources for the code in the comments. Cite by stating who/where the code came from and how it was modified. You must understand and be ready to explain all code in your submissions.
- **You may use** assets (images, sounds) from online sources if they are freely permitted to be used. For simplicity, you may only use explicitly [CC0](#) / Public Domain licenced assets, and must provide credit to the author and source in your game.
- **You may use** generative AI for game assets and small amounts of code, though be advised that generative AI for code and assets may not work well with Godot. You **must** provide citations in your submitted documents detailing which AI was used and for what purpose. Ensure anywhere that you post your games permit the use of generative AI.
- **You may not** give out your game's code to students in other teams, though you can provide links to helpful resources or help explain general concepts and provide a few lines of **general-purpose** example code that does not directly influence the design of their game.
- **You may not** work on assignments with other students, friends, or family outside of your team, however you may show off in-progress work for playtesting purposes and receive technical assistance. Keep track of anyone who provides design feedback to provide them with fair credit.
- **You may not** talk to anyone while taking the midterm quizzes or discuss the quiz content until quiz grades are released.

3. Assignment and Quiz Accommodations

Assignment Accommodations

Assignments are graded best 4 out of 5, but a **complete submission is required for each**. You are fully expected to complete each assignment during the regular assignment period to ensure full marks and sufficient practice before the final project. The dropped assignment is here to support extenuating circumstances preventing access to an assignment and to support unexpectedly low grades on an assignment submission.

If only 4 of 5 submissions are made, your mark will instead be marked **without** the best 4 of 5; i.e., each of the five assignments will be worth 4%, with the unsubmitted assignment receiving a mark of 0. You may submit late or individually to keep the best 4 out of 5 submission policy.

You may submit a single assignment any time until March 28 at 11:59PM, but a small grace period will be enabled to the submission to allow a few hours after the deadline before it cuts off.

1. **Our group submitted after the deadline, and it is marked late.**

Any submissions after the deadline will be considered PASS/FAIL. This will not receive a percentage grade, but if it is considered sufficiently complete, it will be dropped (providing Best 4 out of 5 for your other submissions).

2. **I could not attend a tutorial and cannot work with my assigned group.**

An "Individual Assignment Submission" assignment page is available on Brightspace so that you can work individually and submit any time until March 28, 11:59PM. You can only utilize this individual submission once without explicit permission from the instructor, which is only granted under long-term, extenuating circumstances.

3. **I have submitted each assignment on time with my group, but I am unhappy with my group's performance and would like to submit individually.**

Your lowest assignment mark will be automatically dropped. Additional marks can be made up by completing additional Side Quests, worth up to a 3% bonus.

Project Accommodations

The project deadlines are final. The weekly milestones and attendance marks are important components to ensure consistent work with your team. If you would like to make up missing marks from milestones, you may submit additional Side Quests, worth up to a 3% bonus.

Quiz Accommodations

If you are experiencing a short-term incapacitation preventing access to writing a quiz, you may reach out to the instructor immediately and submit an Academic Consideration Request Form as per the information available on the [Registrar's website](#). You must reach out within 24 hours of the quiz closing date for accommodation consideration to receive an opportunity for extension. If you cannot write in the accommodated extension period, you will be asked to write later for a "late-quiz attempt" make-up. If you receive a passing mark, the late quiz will be dropped, and the weight will shift to your other quiz. If you do not receive a passing mark, the quiz will receive the lowest mark between both quizzes.

4. Course Modality

This course involves in-class activities, graded quizzes, and discussions, and thus must be **synchronous**, or live-streamed. We will be meeting on Zoom for lectures and tutorials; tutorial software is subject to change.

You may need to be able to attend the course Discord during lectures for in-class group activities. Make sure your attendance method allows you to attend both Zoom and Discord simultaneously.

You are expected to attend **every class**. Class recordings will be posted up to **one week later**, but you may miss out on important in-class activities and discussions and recordings should not be relied upon as a consistent replacement for attendance.

While you are not strictly required to have a camera on, the lecture will be in “Focus Mode”, meaning that only the instructor can see your camera and it should not appear in recordings, but technical issues could potentially mean cameras could appear temporarily. You are requested to turn a camera on to help gauge engagement and build familiarity during lectures, and it is **very highly requested** to have a camera on in tutorials to help with group conversations. You **must** have a working microphone to interact with each other. **Please be aware:** if you turn on your camera or speak during lectures (which is both allowed and encouraged), you may appear in the recording that is posted to Brightspace. You are **not** permitted to share these recordings to help maintain privacy.

Please note that by participating in these lectures, either online or in-person, that you may be included in these recordings. When attending on Zoom, Zoom will always notify meeting participants that a meeting is being recorded. It is not possible to disable this notification.

*These recordings will only be available to the members of this class, and **I ask that everyone be respectful and not allow others to view the recordings.** At the end of the course, the recordings will be deleted.*

Please note that recordings are protected by copyright. The recordings are for your educational use, and you are not permitted to publish to third party sites. **If you have concerns about being recorded**, please email the instructor directly so we can discuss these.

Please note that modality may change if necessary - for example, courses may be pre-recorded if the instructor falls ill.

5. Communications Policy

The only emails sent directly to TAs and the instructor should require the confidentiality of direct email.

Importantly: Before emailing, **check the Discord, review the syllabus, check announcements, and review lecture recordings.** Anything easily answered by these components may be ignored, or possibly redirected to the material to evaluate for yourself. There are three major communication channels you need to be aware of for this course:

- **Discord:** Discord will be the primary place to post general questions about the course and to attend office hours. Information for accessing the Discord will be available on Brightspace and announced via email.
- **Email Announcements:** While Discord will have the most announcements, severely important messages will be sent via Brightspace announcements and should be checked daily.
- **Assessments, Tools:** Brightspace will be the primary source for all course material, including assessment specifications, additional readings, calendars, and quizzes. Please review the page occasionally for updates.

You should not email regarding:

- **Assignment Clarifications:** For code support where confidential code is required, please attend TA office hours or request instructor office hours via email if it could not be resolved during TA hours.
- **Due Dates:** All due dates are posted on Brightspace and/or in the course outline.
- **Grade Release:** Grades should be released on a regular schedule, but if you are **truly concerned** about when grades are released, you can post publicly to ask.
- **Policy Questions:** As the policies are all public information, if it is a general inquiry about what a policy means, this should be asked publicly. Of course, if you are inquiring about personal circumstances, send an email privately.
- **Material Questions:** If you are uncomfortable asking publicly, I'm still happy to help in private via email or we can schedule an office hours appointment, but please consider that other students likely have the same question as you and would benefit from hearing the response. If you are comfortable posting questions about material publicly, it can promote valuable discussion!
- **For technical issues** first look on the course website, then the SCS [technical support page](#), then if it can be discussed publicly post to the class Discord, otherwise inquire with the teaching assistants in office hours who may forward your concern to the instructor.

Students must behave in a professional manner in all communications. Any communication that is seen as discourteous and unprofessional may be moderated, ignored, or in the worst case reported to the university.

Please Note: The content of your communication and your submissions should be professional and work-friendly. Communications or subject matter content that is deemed highly offensive or inappropriate may be forwarded to the dean for possible disciplinary action.

Students are expected to check their Carleton email addresses and Discord announcements **daily** for updates. For convenience, you can set up your Brightspace notifications to reduce email volume. Note that you should **not expect responses outside of business hours (8:30AM - 5:30PM, Monday-Friday)**. Due to high volumes, expect up to three-business days to receive a response. Plan ahead and try to ask questions before the weekend or evenings. Anyone not following the communication guidelines risks having their communication go ignored or redirected, so please try to follow the guidelines as best as you can.

6. Important Course Policies

Office Hours: TA Office hours are available to help with material, assignment disputes, or assignment clarification. TA office hours schedules will be posted and made available to the course website. If you require additional support with the course material, you may request office hours with the instructor following the instructions posted to the course website. While I encourage requesting office hours to get the support you need early, please understand that availability is limited and not all requests may be fulfilled.

Not following submission guidelines is grounds for a zero. If your submission does not match the submission requirements exactly (which are clearly posted on each assignment), your submission may receive a zero. Make sure to double check the submission guidelines before and after submitting your assignments online. If the requirements are unclear or you are otherwise incapable of meeting them, meet with a TA during office hours, post to Discord, or finally contact the instructor.

If a submission does not run for any reason, or if instructions for play are incomplete or unclear, it may receive a mark of zero. It is recommended that as soon as you upload your assignment, you should download and test it again to make sure everything is correct, and make sure to submit clear and complete instructions.

The final project submission is final. Consider your final project with the same importance you would consider a final exam - once the project submission time is reached, there is unfortunately very little room for any kind of additional accommodations. Ask questions ahead, triple check your submissions, and feel free to come by office hours to check-in on your submission in advance. We cannot provide detailed grading notes, but can discuss general points about your submission.

It is your responsibility to dispute grades within one week of receiving them if there is an error. Concerns must first be communicated to the teaching assistant that graded the assessment, then if the result is unsatisfactory, can be forwarded to the instructor. After one week, **no further consideration will be offered and marks will not be changed.**

Try to avoid upsetting or controversial topics in your game submissions. To best support an environment focusing on mechanics design, playtesting, and collaboration, and understanding that many students and teaching assistants will be playing your submissions, ensure that your work follows Carleton's human rights policies and procedures and does not include any potentially harassing or discriminatory content or themes. You can have fun with the theming but keep content appropriate for sharing and be respectful of your fellow classmates and TAs.

Do not feel pressured to play a game or work with a team that you are uncomfortable with. You may opt to test another game if you are uncomfortable with the theming or content, and if you find any submissions harmful for distressing, please reach out to the instructor.

8. School of Computer Science Information

Undergraduate Advisor: The Undergraduate Advisors for the School of Computer Science are available in Room 5302HP; or by email at scs.ug.advisor@cunet.carleton.ca. The undergraduate advisors can assist with information about prerequisites and preclusions, course substitutions/equivalencies, understanding your academic audit and the remaining requirements for graduation. The undergraduate advisors will also refer students to appropriate resources such as the Science Student Success Centre, Learning Support Services and Writing Tutorial Services.

SCS Computer Laboratory: Students taking a COMP course can access the SCS computer labs. The lab schedule and location can be found at: <https://carleton.ca/scs/tech-support/computer-laboratories/>. All SCS computer lab and technical support information can be found at: <https://carleton.ca/scs/tech-support/>. Technical support staff may be contacted in-person or virtually, see this page for details: <https://carleton.ca/scs/tech-support/contact-it-support/>

9. University Policies

For information about Carleton's academic year, including registration and withdrawal dates, see [Carleton's Academic Calendar](#).

Academic Accommodations

Carleton is committed to providing academic accessibility for all individuals. Please review the academic accommodation available to students here: <https://students.carleton.ca/course-outline/>.

Academic Integrity

Student Academic Integrity Policy. Every student should be familiar with the Carleton University Student Academic Integrity policy. A student found in violation of academic integrity standards may be sanctioned with penalties which range from a reprimand to receiving a grade of F in the course, or even being suspended or expelled from the University. Examples of punishable offences include plagiarism and unauthorized collaboration. Any such reported offences will be reviewed by the office of the Dean of Science. More information on this policy may be found on the ODS Academic Integrity page: <https://carleton.ca/registrar/academic-integrity/>.

Plagiarism. As defined by Senate, "plagiarism is presenting, whether intentional or not, the ideas, expression of ideas or work of others as one's own". Such reported offences will be reviewed by the office of the Dean of Science. More information and standard sanction guidelines can be found here: <https://science.carleton.ca/students/academic-integrity/>.

Unauthorized Collaboration. Senate policy states that "to ensure fairness and equity in assessment of term work, students shall not co-operate or collaborate in the completion of an academic assignment, in whole or in part, when the instructor has indicated that the assignment is to be completed on an individual basis".

...And I hope you enjoy the course and have a great term!