COMP1501A (Winter 2025)
Introduction to Computer Game Design

Instructor: Connor Hillen

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Office Location: 5370 Herzberg

Best Ways to be in Touch: In class, during student hours, Brightspace forums. Private concerns via email or student hours, include [COMP1501] in the subject line.

Teaching Assistant: A list of teaching assistants and their contact/student hours information will be posted once the course starts.

Class Location: Zoom Link will be posted to Brightspace prior to first lecture.

Lecture Times: Tue. Thu. 10:05 – 11:25

Tutorial Times: Mondays

- A1: 13:05-14:25
- A2: 10:05-11:25
- A3: 16:05-17:25
- A4: 11:35-12:55
- **Tutorials begin Monday, Jan. 13th**

Course Website:
https://brightspace.carleton.ca/d2l/home/283276

Important dates and deadlines can be found here: https://carleton.ca/registrar/registration/dates/academic-dates/, including class suspension for fall, winter breaks, and statutory holidays.

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

Learning Material(s) and Other Course/Lab-Related Resources
All course texts are **optional** and freely available via Carleton's O'Reily Portal here, though some restrictions may be placed on availability: https://library.carleton.ca/node/16228
- (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.

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/4.3/index.html

Topics Covered and Learning Outcomes

Week	Topic/Content	Readings/Prep for Class
1	Design and Structure	Read outline and policies
2	Why We Play	Review PlayingCards.io before tutorial.
3	Dynamics of Fun	
4	Target Experiences	
5	Godot & Quiz	
6	Godot & Physics	Complete the Godot tutorial and bring questions.
7	Winter Break	
8	Project & Production	
9	Space and Pacing	
10	Dynamics with Math	
11	Stories and Quiz	
12	Characters & AI	
13	Review & Extra Topics	Prepare questions for class!
14	Presentation Day!	Submit your project and marketing materials

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.

- **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.

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

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/

For this class, we will be using the Godot Game Engine, specifically **Version 4.3**.x (e.g., 4.3.1, 4.3.2). The Godot Game Engine is free, lightweight, and open source.

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. 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. While it may seem daunting to learn the ropes of the engine mostly on your own, many students have successfully picked up enough of the Godot engine to make some very interesting and engaging projects!

Assessment Scheme

Assignments must be submitted and ready to demonstrate **before** your subsequent tutorial.

COMPONENT	GRADE VALUE	DATE
Assignments	20 % (5%xBest 4 of 5*)	
Assignment 1		Due Mon. January 20
Assignment 2		Due Mon. January 27
Assignment 3		Due Mon. February 03
Assignment 4		Due Mon. February 10
Assignment 5		Due Mon. February 24
Final Project	40 %	Due Mon. April 07
Side Quests	5 %	2.5% Before Winter Break; Varies
Quiz 1 (**Online Asynchronous**)	7.5 %	Feb 06 at 08:00 – Feb 07 at 18:00
Quiz 2 (**Online Asynchronous**)	7.5 %	Mar 20 at 08:00 – Mar 21 at 18:00
Final Exam (**In-Person**)	20 %	Scheduled by Registrar

Assessment Scheme Automatic Re-Weighting

- **Assignments:** Assignments **must all be submitted** to receive the Best 4 out of 5 grading scheme, otherwise each assignment (including zeroes) **will be worth 4% each**. Review the accommodations section for additional information about this policy.
- **Quizzes:** Your quiz scores will be automatically replaced by your final exam score if you receive a higher grade on your final exam.

- **Extra Credit:** You can complete up to **3%** in additional Side Quests to earn extra credit.

Assessment Types

5 Weekly Assignments: Each week before Winter Break, 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 randomly formed in advance on Brightspace. Tutorial attendance is **<u>mandatory</u>** to receive assignment marks.

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

1. (Team A) Paper Prototyping: Design a game from a starting goal, test it, and provide instructions.
2. (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.
3. (Team B) Disruption: Take an existing game and radically disrupt one major aspect of it, then test how well the game works.
4. (Team C) Experience Game: Given a target experience, design a game which gives the feeling of the target experience without purely simulating it.
5. (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.

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.

Side Quests: A selection of "Side Quests" will be available on Brightspace. These are small tasks designed to engage you in different aspects of game design and development which you are most interested in. You can choose which quests to complete, each rewarding a certain percentage for completion. 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:** 2.5% worth of your side quest grade is **due** <u>before the start of winter break</u>. There are recommended side quests to reach this 2.5% with details posted to Brightspace.

Asynchronous Quizzes: There are two quizzes which will be held on Brightspace asynchronously. Class will be cancelled during the running of these quizzes to allow time to write if the reserved time is needed. They must be completed individually. The first quiz covers design theory and game decomposition, and the second covers more technical and math-related skills. The **final exam is in-person** and covers the content of the first two quizzes and the final course topics.

Assignment & Project AI and 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.** You may be requested to demonstrate the tasks you completed during the assignment / project based on feedback.

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. At no point should you pass off anyone else's work as your own.
- **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.

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.

We will primarily use Brightspace forums for conversations, and you are strongly encouraged to make use of them to chat and discuss with peers. **Why not Discord?** Discord requires a level of moderation we are unfortunately not able to provide. It opens the opportunity for students to be hacked and requires some students to start new accounts with third-party companies. I want to encourage fun, professional, and courteous conversations – but we will keep this to the Brightspace forums for now. I am always open to suggestions to improve the experience and keep the class collaborative.

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, though camera is unlikely due to the focus mode setup. You are **not** permitted to share these recordings to help maintain privacy.

Please note that by participating in these lectures 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.

Important Assignment Submission Policies

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. If you would like to touch on serious topics that might be considered difficult subject matter, please reach out to the instructor to discuss ways of handling the topic with care and ensuring good for other's well-being.

We will occasionally see content with difficult subject matter in class to support different topics. Students will be warned of this content before it appears.

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.

Late and Missed Work Policies

Late Assignments

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).

Late projects will not be accepted and must be submitted prior to the cut-off on Brightspace.

Missed Work

Some assessments can have accommodation considerations and many have automatic policies that do not require reaching out. Review the requirements and policy here: https://carleton.ca/registrar/academic-consideration-policy/ to determine if your circumstances qualify for accommodation.

1. **Missed Quizzes:** Quizzes will automatically have their weight shifted to the final exam. You can request to have the quiz opened-up to still write without marks to get experience with the questions and discuss it in student hours. If you are experiencing a short-term

2. **Missed Tutorial:** Once during the term you may submit to the "Individual Assignment Submission" page before the official assignment submission deadline to receive marks for individual work.

3. **Second Missed Assignment Tutorial:** You may submit individually once until **March 30 @ 23:59** to have the submission marked SAT/UNSAT with a SAT submission allowing your assignments to be marked Best 4 out of 5 (i.e., dropping the SAT submission).

4. **Third Missed Assignment Tutorial:** You must contact the instructor within 24 hours of the missed tutorial and be prepared to fill out the short-term or long-term academic consideration for course work forms.

5. **Missed Project Tutorial/Milestone**: The tutorial attendance and milestones are intended to keep you on track during the project and ensuring equal collaboration with your team. If you are unable to complete the project with your team long-term due to extenuating circumstances, you can review the long-term accommodation needs at the policy page linked above and contact the instructor as soon as you are aware of this to consider accommodations such as completion of the project individually. As there are marks specifically for learning how to collaborate with team members, some marks may be lost for not working individually.

6. **Missed Side Quests:** No accommodations will be provided for missed side quests.

Communication Policy

In order to reduce the volume of emails and expedite responses, the only emails that should be sent to the instructor, teaching assistants, or lab coordinators should **require confidentiality** or is personal in nature and be handled via direct email from a Carleton email address. Your first point of contact for support about course support or other information should be the Brightspace forums or student hours with TAs and the instructor.

Students are expected to **check their Carleton email addresses <u>daily</u> for announcements.** Reminders for upcoming assignment deadlines will be handled using the default Brightspace notifications system, so if you require reminders, check that your Brightspace settings will send notifications.

Students should only **expect responses within 3 business days** during **business hours (8:30AM - 5:30PM, Monday - Friday)**. <u>Plan ahead</u> - questions asked over the weekends may go unanswered until the following week. Email communication may be delayed if there is a high volume of emails, so any messages which can be answered in the syllabus, recent course announcements, or could be asked on the course forums as it does not require exposing personal information may be low-priority and you are encouraged to attend student hours.

To make sure communication is handled in a timely manner, follow these guidelines:

1. Any **email communication** must include **your name, student ID, and course code** and must be sent from an official Carleton email address. As I teach multiple courses, please include **the course code in the subject line.**
2. **Assignment questions** should *first* be dealt with by discussing with a TA during student hours or via the Brightspace forums. If you have concerns about grading and cannot contact your TA, or if you have concerns about the TAs, please contact our lab coordinator.
3. **Course material assistance** can be handled via Brightspace forums, TA student hours, or instructor student hours.
4. **For technical issues,** first look on the Brightspace forums or the course resources, then check the [SCS technical support page](https://carleton.ca/scs/scs-laptop-requirement/), then inquire with teaching assistants who may forward your concern to the instructor.

Students <u>must</u> behave in a professional manner in all communications. Any communication that is seen as abusive, discourteous, or unprofessional may be moderated, ignored, or reported to the university for disciplinary action.

School of Computer Science Laptop Requirement (only applies to on-campus courses)

Every student that has been enrolled in a 1000-level (i.e., first year) course offered by the School of Computer Science after the 2020/2021 school year is required to have a laptop. This includes COMP1001, COMP1005, and COMP1006. For more information, please visit https://carleton.ca/scs/scs-laptop-requirement/ and then review the requirements at https://carleton.ca/scs/scs-laptop-requirement/laptop-specs/.

Undergraduate Academic Advisors (only for UG course)

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/.

Mental Health and Wellness

Carleton offers a wide range of wellness services that I highly recommend reviewing. Whether it is because you are in a rough place, are having a difficult time keeping up with your studies, or would just like to bolster your skills for mental, physical, or academic well-being, check out the Carleton Wellness Website for information about the services offered. Most are free and confidential. If you ever feel unsafe or are having an emergency on campus, you can contact campus safety from any Carleton phone by dialing 4444 or from your own phone at 613-520-4444. If you would like help navigating supports or would like help connecting with a member of the wellness team who can help identify the resources to help you get through a distressing situation, you can review the resources or reach out to me and I am happy to help connect you with people who can help.

Academic Accommodations and Regulations

Academic Accommodation

Carleton is committed to providing academic accessibility for all individuals. You may need special arrangements to meet your academic obligations during the term. The accommodation request processes are outlined on the Academic Accommodations website (https://students.carleton.ca/course-outline/).

Chat GPT/Generative AI Usage

As someone who has taken some time to research AI to help bolster creativity and support learning, I am happy to discuss appropriate ways and techniques to use AI to support your learning in a way that is less likely to hinder your learning experience and hold back your understanding for future courses.

The use of generative AI during quizzes is strictly **banned** and the use of generative AI to generate ideas or write any documents submitted for class is **banned.** I want to hear your thoughts, your opinions, and test your design understanding. Acceptable uses of AI for coding and asset creation are described in the assessments section earlier in this outline.

As our understanding of the uses of AI and its relationship to student work and academic Integrity continue to evolve, students are required to discuss their use of AI in any circumstance not described here with the course instructor to ensure it supports the learning goals for the course.

Academic Integrity

Students are expected to uphold the values of academic Integrity, which include fairness, honesty, trust, and responsibility. Examples of actions that compromise these values include but are not limited to plagiarism, accessing unauthorized sites for assignments or tests, unauthorized collaboration on assignments or exams, and using artificial intelligence tools such as ChatGPT when your assessment instructions say it is not permitted. If you are unsure of the expectations regarding academic Integrity (if unauthorized collaboration with lab- or classmates is permitted and, if so, to what degree), then you must ASK your instructor. Sharing assignment or quiz specifications or posting them online (to sites like Chegg, CourseHero, OneClass, etc.) is ALWAYS considered academic misconduct. You are NEVER permitted to post, share, or upload course materials without explicit permission from your instructor.

Misconduct in scholarly activity will not be tolerated and will result in consequences as outlined in [Carleton University's Academic Integrity Policy](#). A list of standard sanctions in the Faculty of Science can be found [here](#).

Additional details about this process can be found on [the Faculty of Science Academic Integrity website.](#)

Students are expected to familiarize themselves with and abide by [Carleton University's Academic Integrity Policy](#).

Student Rights & Responsibilities

Students are expected to act responsibly and engage respectfully with other students and members of the Carleton and the broader community. See the [7 Rights and Responsibilities Policy](#) for details regarding the expectations of non-academic behaviour of students. Those who participate with another student in the commission of an infraction of this Policy will also be held liable for their actions.

Student Concerns

If you have any concerns regarding this course, your first point of contact is me. Please email me or visit during my student hours, and I will do my best to address your concerns. If I cannot resolve the issue, the next point of contact is the School of Computer Science at studentconcerns@scs.carleton.ca. If the concern remains unresolved, the final point of contact is the Office of the Dean of Science at ODScience@carleton.ca. Please follow this order of contact.

Note: You can also bring your concerns to [Ombuds services](#).