
**DEPARTMENT OF COMPUTER SCIENCE**

# COSC360

# Computer Game Design

# Summer School

**Paper coordinator**

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**Lectures (online)**

**Practicals (online)**

| Help sessions: | |
|---|---|
| Monday | 3pm-5pm |
| Tuesday | 3pm-5pm |
| Wednesday | 3pm-5pm |
| Thursday | 3pm-5pm |

**Team meetings (online)**

| | |
|---|---|
| Tuesday | 1pm-3pm |
| Thursday | 1pm-3pm |

# Course Description

This course takes a practical, hands on approach to making games. We will design, prototype, implement and polish complete games over the six week course. How do we implement a game in a set timeframe? How do we ensure its quality? What sets successful developers apart from everyone else with a good idea? What do fluffy buns have to do with critiquing a design? Topics covered will include, but are not limited to: programming, project management, game design, visual and audio design and case studies from the industry.

# Learning Outcomes

This paper will enable students to:

- get familiar with the Unity game engine;
- learn about technical aspects of computer game development;
- have the opportunity to design and develop your own 2D computer game in a team of 3–4 people
- learn about various aspects of the game experience;
- have a chance to participate in a full software development cycle.

# Distance Learning

This paper is taught in the Distance Learning mode – all the lectures, practicals and meetings will be done online.

## Communication

General communication with the students will be done via e-mails addressed to the Otago student accounts.

## Equipment requirements

Students must have access to a machine with the minimum specs for running a recent version of the Unity Editor, as well as the following:

- computer microphone and speakers;
- web camera;
- high speed Internet connection.

## Coursework Schedule

| Week | Lectures | Practicals | Assignments | Game development |
|---|---|---|---|---|
| 1 | Overview | | | |
| | Unity Basics | Unity Basics | | |
| | Games and Experiences | Space Invaders | | |
| | Game Mechanics | | | Brainstorming |
| | | | A1 – Improve a Game | Mock CV |
| 2 | Ideas and Feedback | Version Control | | Team Creation |
| | Planning and Risk | | | Team Meeting |
| | Documentation | | | |
| | Prototyping | | | Game Pitch |
| | | | A2 – Game Design Document | |
| 3 | 2D Graphics | Animation | | |
| | Physics | Procedural | | Team Meeting |
| | AI | Pathfinding | | |
| | | | | Team Meeting |
| | | | A3 – Game Prototype | |
| 4 | Level Design | Tilemaps | | |
| | 3D Graphics | Graphics | | Team Meeting |
| | UI | UI | | |
| | | | | Team Meeting |
| | | | | |
| 5 | Player and Indirect Control | | | Alpha Release |
| | Storytelling | | | Team Meeting |
| | Game Balance | | | |
| | | | | Team Meeting |
| | | | | |
| 6 | Wrap up | | | Beta Release |
| | | | | Team Meeting |
| | | | | Game Presentation |
| | | | | |
| | | | A4 – Game project | |
| 7 | | | | |
| | | | Final – Game post-mortem | |

## Lectures

Pre-recorded lectures provide high level coverage of topics on computer game design and development.

## Practicals

Practical exercises provide opportunities for mastering aspects of the Unity Editor and the Unity game engine covering the basics of a wide range of computer game development techniques. Help sessions will be offered via Discord (or an equivalent platform) in Weeks 1 through 5 (see the front page for the *Practicals* help session schedule).

## Game Development

This is a project driven paper and so everything will revolve around the process of developing a 2D game in Unity from concept to release in a groups of 3–4 people. There will be official team meetings with a member of staff present for the purpose of tracking and monitoring the progress of the project (see the front page for the *Team meetings* schedule). Students will be expected to present their game in the idea pitching session (Week 2) as well as present their final game (Week 6). Other game development related events, such as play-testing sessions, may be organised as well.

## Course Readings

**Recommended but not required textbook:**

Jesse Schell, *The Art of Game Design: A Book of Lenses* (2019), 3rd edition, A K Peters/CRC Press.

The book provides extended reading for many lectures.

## Course Administration

The paper will be administered through https://cosc360.otago.ac.nz. An e-mail with instructions for how to login and access website content will be sent out shortly before the start of the Summer School.

## Course Workload and Expectations

This is an 18-point paper. For your guidance, we offer the following breakdown of hours:

| | | |
|---|---|---|
| Lectures | 10 hours | (18 lectures) |
| Practicals | 25 hours | (9 practicals) |
| Studies/Reading | 25 hours | (5h per week for 5 weeks) |
| Assignments + Game development | 100 hours | (4 assignments/project work/meetings) |
| Total | 180 hours | |

Students are expected to watch all the lectures and complete all the practicals.

Students must actively participate in the group effort of the game development, which entails prompt communication with the team members, regular (online) meetings (in addition to the official team meetings listed on the front page of this document), and two presentations.

## Assessment

| **Internal assessment** | **Due** | |
|---|---|---|
| Participation | | **5%** |
| Assignment 1 | Week 1 of the course | **10%** |
| Assignment 2 | Week 2 of the course | **10%** |
| Assignment 3 | Week 3 of the course | **10%** |
| Practicals | Week 5 of the course | **10%** |
| Presentation | Week 6 of the course | **5%** |
| Assignment 4 | Week 6 of the course | **30%** |
| **Final assessment** | Exam period | **20**% |
| **Total assessment** | | **100%** |

## Participation (5%)

Small (individual) marks will be awarded for participation in team meetings as well as (group) marks for timely completion of certain project milestones.

## Assignment 1 (10%)

In this assignment students will need to demonstrate their ability to work with the Unity game engine, after one week of practicals, to implement improvements of their own design to a classical computer game. This is an individual assignment.

Students will be assessed on:

- basic skills using the Unity game engine;
- game design ideas.

## Assignment 2 (10%)

For this assignment the teams will need to present a Game Design Document for the game they intend to build in this paper. This is a group assignment.

Teams will be assessed on:

- demonstration of a careful and objective consideration given to the process of implementing a game;
- careful planning and estimation of what is achievable.

## Assignment 3 (10%)

For this assignment the teams will work on rapid prototypes that demonstrate and test the basic elements of their game. This is a group assignment.

Teams will be assessed on:

- the quality of the investigation of the unknown aspects of the project;
- the use of the information gained to refine and develop both the project plan and game design.

## Practicals (10%)

For each practical, students will follow a tutorial that demonstrates a particular capability of the Unity Editor. The resulting code/project will be submitted via git.

Students will be assessed whether:

- the implementation is correct as intended per instructions;
- the exercise is complete.

## Presentation (5%)

Students will present their (almost) finished games to the class and/or (perhaps) the external audience. The point is to showcase the games, maybe say something of interest about its development. Students will present as a team.

Teams will be assessed on:

- the quality of the talk;
- whether the game was showcased well.

### Assignment 4 (30%)

For this assignment students will need to produce the final, WebGL version of the game. This is a group assignment.

Given the varying nature of the game projects, different aspect may take on different importance for each team, nevertheless, the teams will in general be assessed on:

- the novelty of the idea;
- the overall polish;
- implementation of the core game play mechanics;
- progression;
- art/graphics;
- story;
- audio;
- UI;
- replay value;
- bugs;
- fun factor.

### Final assessment (20%)

For this assessment students will individually submit a written evaluation of the project as well as a critical analysis of the game produced in this paper. This is an individual assignment.

Students will be assessed on:

- the level of insight and professionalism of the analysis;
- the quality of the write up.

## Submitting Assignments

All practicals and assignments must be submitted electronically via GitLab and https://cosc360.otago.ac.nz.

## Assignment Returns

It is University policy that assignments must be marked, graded and returned to students within three weeks from the date the assignment was due.

The content management system on https://cosc360.otago.ac.nz will provide information when when assignments will be ready and when they will be available for viewing. Due to compactness of the summer school timeline there will be no extensions on any of the assignments.

## Academic Integrity and Academic Misconduct

Academic integrity means being honest in your studying and assessments. It is the basis for ethical decision-making and behaviour in an academic context. Academic integrity is informed by the values of honesty, trust, responsibility, fairness, respect and courage. Students are expected to be aware of, and act in accordance with, the University's Academic Integrity Policy.

Academic Misconduct, such as plagiarism or cheating, is a breach of Academic Integrity and is taken very seriously by the University. Types of misconduct include plagiarism, copying, unauthorised collaboration, taking unauthorised material into a test or exam, impersonation, and assisting someone else's misconduct. A more extensive list of the types of academic misconduct and associated processes and penalties is available in the University's Student Academic Misconduct Procedures.

It is your responsibility to be aware of and use acceptable academic practices when completing your assessments. To access the information in the Academic Integrity Policy and learn more, please visit the University's Academic Integrity website or ask at the Student Learning Centre or Library. If you have any questions, ask your lecturer.

- Academic Integrity Policy
- Student Academic Misconduct Procedures

## Support Services

**Class representatives.** Volunteers for class representative will be registered at the beginning of this course. The class representative is intended to help facilitate staff-student communication, enabling liaison, consultation and passage of information between teaching staff and the student body. Representatives usually meet with representatives of the academic staff twice a semester for about one hour. A full job description for the class representative is available from the Otago University Student's Association.

**University Library.** The Library website, `https://www.otago.ac.nz/library`, gives online access to Library services and resources including databases, past exam papers, referencing guides and the booking system for group study rooms.

**Support for international students:** `https://www.otago.ac.nz/international/support-services`.

**Disabilities information and support:** `https://www.otago.ac.nz/disabilities`.