CPSC 585 - Game Programming (Winter 2025)

Instructors: Nigel Brooke, Alexei Pepers, Stephen Ma, Richard Zhao, Matthew McConnell

Teaching Assistant: Matthew McConnell

Lectures: Monday January 6 – Friday January 10, 2025, 9am - 5pm
Location: ICT 516
Lecture is in-person only and not recorded.

Weekly TA meeting: Fridays in MS 139. January 17 - April 11, 2025

Contact

Nigel: nigel@steamclock.com (Questions about lecture material and assignments)
Alexei: alexeipepers@gmail.com (Questions about specific lecture material)
Stephen: tehphen@gmail.com (Questions about specific lecture material)
Richard: richard.zhao1@ucalgary.ca (Questions about course logistics, room access, registration, etc.)
Matthew: matthew.mcconnell1@ucalgary.ca (Project support)

Prerequisite:

CPSC 453 - Computer Graphics.
Students must apply for permission to enroll in the course through the course instructor.

Objectives

This course provides an introduction to video game development. Its main objective is to expose the students to the processes and techniques of creating video games. Teams of students will experience a condensed version of the entire video game development process, designing and developing a game from scratch, including its underlying game engine.

Assignments and Grading

- Project **100%**
    - Milestone 1 - **10**% *(January 24, 2025, 1pm MST)*
        - High-concept design document
        - Feature list, task estimates and assignments, rough schedule
        - Game application framework
        - Private GitHub repo created
    - Milestone 2 – **15**% *(February 14, 2025, 1pm MST)*
        - "Red brick" level rendering
        - Player driving model
        - Ability to load a model into the game
        - Some functional gameplay

- Adequate camera functionality
- Private GitHub repo main branch updated
- Milestone 3 – **15**% *(March 7, 2025, 1pm MST)*
    - First playable - "alpha"
        - Most game rules implemented
        - Functional opponent driving AI
        - Working 3D, audio engine
        - Refined gameplay
    - Private GitHub repo main branch updated
- Milestone 4 - **10**% *(March 28, 2025, 1pm MST)*
    - Feature complete - "beta"
    - Private GitHub repo main branch updated
- Playtest Session - **5**% *(April 2, 2025)*
    - Each group to sign up with Richard for an hour - all team members must attend
    - Bring your game to UCalgary Open House for playtesting and feedback gathering
- Milestone 5 - "Final" Product – **45%** *(April 18, 2025, 1pm MST)*
    - *Source code as well as release mode binaries (for Windows 10) should be included.*
    - Private GitHub repo main branch updated - could make public at this point
- Wow Factor – up to **10%** bonus

Students must attend all 5 days of the block week lectures to receive a passing grade (D or higher) in the course.

Late Policy

10% of total grade deduction per day for the entire group that a submission is late.

Tentative Schedule

Day 1: Monday, January 6
09:00-10:00 Introductions & Course Overview
10:00-10:45 Gaming Industry
10:45-11:30 Fun
11:30-12:00 Gameplay
12:00-13:00 LUNCH
13:00-14:30 Game Architecture 1
14:30-15:30 Game Architecture 2
15:30-17:00 *Workshop: Game design brainstorm, pitches*

Day 2: Tuesday, January 7
09:00-10:00 Experiences with CPSC585

10:00-11:00 Development Languages
11:00-12:00 Memory and Game Content
12:00-13:00 LUNCH
13:00-14:00 Graphics 1
14:00-15:00 Graphics 2
15:00-16:00 *Workshop: Examining Assassins Creed Odyssey*
16:00-17:00 *Workshop: Game design continued*

Day 3: Wednesday, January 8
09:00-10:30 Physics
10:30-11:30 Driving Simulation
11:30-12:30 *Workshop: Examining Rocket League*
12:30-13:30 LUNCH
13:30-14:30 Driving AI
14:30-15:30 Console Architecture
15:30-17:00 *Workshop: Technical design*

Day 4: Thursday, January 9
09:00-11:00 Real-time Programming
11:00-12:00 *C*++ Pitfalls
12:00-13:00 LUNCH
13:00-14:00 Networking
14:00-15:00 Game Engines
15:00-16:00 *Workshop: Uncharted 4 or The Last of Us 2*
16:00-17:00 *Workshop: Debugging Roundtable (+Project workshop if time permits)*

Day 5: Friday, January 10
09:00-10:00 Procedural Content Generation
10:00-11:00 Sound
11:00-12:00 *Workshop: Getting into the industry*
12:00-13:00 LUNCH
13:00-14:00 The Future of the Games Industry
14:00-15:00 Project Management
15:00-15:15 Course expectations, student expectations, intellectual property
15:15-17:00 Wrap up and next steps