Game Development

(COSC-019-10)

Summer – 2023

Professor Evan Barba

Monday, Tuesday, Wednesday, Thursday 1:10pm – 3:15pm
ICC 113 (but hopefully moving to the CCT Studio in Car Barn 318)

Google Drive for deliverables:

Prof. Evan Barba (eb892@georgetown.edu)
     Office Hours: Everyday after class
     Car Barn 311E

Summary
This course will engage computer game development at both critical and practical levels. At the theoretical level, this course will examine games as an interdisciplinary boundary object to be critiqued from a variety of perspectives. Class time will typically begin with a 30-45 minute lecture on a topic in a related discipline that could range from the purely functional (how to organize assets in your workflow) to the technical (how does collision detection work?) to the theoretical (what do games have in common with the 'curiosity cabinets' of the Renaissance?). The remainder of class time will be devoted to questions, demonstrations, and tutorial exercises.
Students will be required to demonstrate steady progress in the development of Unity assets, real world simulations, and games, by hitting agreed-upon development milestones. Grades will be given based on the complexity of the tasks achieved and overall progress in understanding and utilizing the development pipeline. The course will be directed toward beginning students with some programming experience, while advanced students with more experience will be allowed to work ahead.

The Unity development environment is an industry standard game development platform that allows game makers to deploy games on a wide range of devices and media including mobile, web, and VR. Unity is free for students and students will be expected to use and maintain their own Unity installation (computers will not be provided). Because of the compressed summer schedule, students should expect to commit a minimum of two hours per day outside of class time to complete assignments.

Instructional Continuity: Should there be a disruption in regularly scheduled meetings the instructor will determine how best to reintegrate missed coursework. Students will be asked for input and preferences when making this determination.

Honor Statement
All students are expected to be familiar with and will be held to the Georgetown University Honor Policy outlined in: https://honorcouncil.georgetown.edu

Title IX/Sexual Misconduct

Georgetown University and its faculty are committed to supporting survivors and those impacted by sexual misconduct, which includes sexual assault, sexual harassment, relationship violence, and stalking. Georgetown requires faculty members, unless otherwise designated as confidential, to report all disclosures of sexual misconduct to the University Title IX Coordinator or a Deputy Title IX Coordinator. If you disclose an incident of sexual misconduct to a professor in or outside of the classroom (with the exception of disclosures in papers), that faculty member must report the incident to the Title IX Coordinator, or Deputy Title IX Coordinator. The coordinator will, in turn, reach out to the student to provide support, resources, and the option to meet. [Please note that the student is not required to meet with the Title IX coordinator.]. More information about reporting options and resources can be found on the Sexual Misconduct Website: https://sexualassault.georgetown.edu/resourcecenter.

If you would prefer to speak to someone confidentially, Georgetown has a number of fully confidential professional resources that can provide support and assistance. These resources include:

Health Education Services for Sexual Assault Response and Prevention: confidential email sarp@georgetown.edu

Counseling and Psychiatric Services (CAPS): 202.687.6985 or after hours, call (833) 960-3006 to reach Fonemed, a telehealth service; individuals may ask for the on-call CAPS clinician

More information about reporting options and resources can be found on the Sexual Misconduct Website.

Course Goals

Students can expect to learn:

- Essential concepts and contexts in game and simulation development.
- How to import, manage, and combine assets such as audio, video, 2D and 3D models into scenes.
- How to write C# scripts that govern the behavior of characters and objects in the Unity virtual environment.
- How to test and iteratively refine gameplay.
- How to justify their design decisions by referencing a critical-historical context.

Student Expectations

Responsibilities for the class include completing all homework assignments and completing projects. Students will be expected to post project documentation to the course google drive. Work in this class is heavily individualized and all students are expected to be self-motivated in their learning. I assume you are taking this class because you want to learn these skills, and that will involve some struggling with the learning process. I am here to guide your learning, to give you advice on how to proceed, and to help you solve the problems you encounter, but you must provide the drive and motivation.

Attendance and participation in this class are required and attendance policies will be enforced. ANY unexcused absence will drop your grade one level (A becomes A- or B+ becomes B). Any excused absence requires at least TWO WEEKS NOTICE (excepting emergencies) in writing explaining why you will miss the class and how you will make up the work you miss. There will be a 5-minute grace period at

the beginning of class for tardiness. If you are more than 5 minutes late you will be marked as such. If you are late twice it will count as an absence. If you are more than 20 minutes late you will be marked absent.

ALL labs, posts, and projects MUST be completed and submitted by the due date to receive credit, **late assignments will not be accepted. NO EXCEPTIONS.**

Course Drive

I will use georgetown's google drive as a repository for all course materials. You will have your own sub-folder in a course folder and you should use this for all your course deliverables.

Grading
→ 40%: Prototypes
→ 15%: Challenges
→ 10%: Quizzes
→ 35%: Personal Project

Rubric for Final Project

31-35 points: Game is playable without noticeable bugs. There is a winning/losing condition, or opportunity for advancement through a score-keeping system of some sort. Assets including sound are integrated smoothly and contribute to the overall look and feel of the game. There is variation in game elements (enemies/objects/actions), that make the game interesting and variable. Code and hierarchy are neat & commented, using correct conventions. Project shows some original concept or novel twist on an existing game. There is polish on most or all elements of the game. Clear mastery of appropriate concepts and techniques found in the tutorials is demonstrated.

21-30pts: The game is playable with a few bugs that do not affect core gameplay. Basic score-keeping or winning/losing is functional. There is some variation in game elements. Code and hierarchy are organized. Concept is consistent with genre conventions, if not wholly original. Facility with the concepts and techniques from the tutorials and challenges is demonstrated.

10-20pts: The game is playable. There are some bugs and a few features. Assets are appropriate although not very varied or distinct. Code and hierarchy are sparse, disorganized, or otherwise messy. An end condition or points system is not present or only rudimentary. There is little polish on game elements.

0-9pts: The game does not run or is not playable in any stable way. Code and hierarchy are undeveloped or otherwise inadequate.

Weekly Schedule

Day 1: 6/05/23 - Introduction

Sign up for Unity

Homework: Get your Unity student account activated.

"Unity Essentials: Getting Started with Unity"

Day 2: 6/6/23 – Unity Essentials

"Unity Essentials: Explore Unity"

       Project Essentials of Real Time 3D

Homework:

- Review Create with Code 1 Tutorials
  - Unit 1 – Player Control
    - Tutorial Unit 1 Introduction

Begin Junior Programmer Pathway

Day 3: 6/7/23 – *Mission 1: Create with code 1*

Tutorials:

- Lesson 1.1 Start your 3D Engines
- Lesson 1.2 Pedal to the Metal

Day 4: 6/8/23 –

Tutorials:

- Lesson 1.3 – High Speed Chase ~50min
- Lesson 1.4 – Step into the Driver's Seat ~50min

Homework:

- Tutorial – Introduction to project management and teamwork
- Challenge 1 – Plane Programming
- Lab 1 – Project Design Document (teams)
- Quiz 1 (screenshot score for credit)
- Unit 2 – Introduction

Day 5: 6/12/23 –

- Lesson 2.1 – Player Positioning
- Lesson 2.2 – Food Fight

Day 6: 6/13/23 –
- Challenge 2 – Play Fetch
- Lab 2: New Project with Primitives

Homework: Begin *Mission 2: Create with Code 2*
- Unit 3: Introduction
- Quiz 2

Day 7: 6/14/23 –
Tutorials:
- Lesson 3.1- Jump Force
- Lesson 3.2 – Make the World Whiz By

Day 8: 6/15/23 –
- Lesson 3.3 – Don't Just Stand There
- Lesson 3.4 – Particles and Sound Effects

Homework:
- Challenge 3 – Balloons, Bombs, & Booleans
- Lab 3 – Player Control
- Quiz 3
- Unit 4 Introduction

Day 10: 6/20/23 –
- Lesson 4.1- Watch Where You're Going
- 4.2 – Follow the Player

Day 11 6/21/23 –
- Lesson 4.3 – PowerUp & Countdown
- Lesson 4.4 – For-Loops For Waves

Day 12: 6/22/23 –

- Challenge 4 – Soccer Scripting
- Lab 4 - Basic Gameplay

Homework

- Quiz 4
- Unit 5 Introduction

Day 13: 6/26/23 –

- Lesson 5.1 - Clicky Mouse
- Lesson 5.2 - Keeping Score

Day 14: 6/27/23 –

- Lesson 5.3 - Game Over
- Lesson 5.4 - What's the Difficulty?

Day 15: 6/28/23 –

- Challenge 5 - Whack-a-Food
- Lab 5 - Swap out your Assets

Homework

- Quiz 5

Day 16: 6/29/23

- Introduction to user feedback and testing

Day 17: 7/3/23

- Lesson 6.1 – Project Optimization
- Lesson 6.2 – Research and Troubleshooting

Day 18: 7/4/23

- Lesson 6.3 – Sharing and Feedback

Day 19: 7/5/23

- Game Refinement and Playtesting

Day 20: 7/7/23
- Game Refinement and Playtesting

FINAL PROJECT DUE

There will still be a few remaining Unity tutorials needed to complete the Junior Programmer Pathway and receive your Unity badge.

Go for it!