

MSIM 408/508 & ECE 407/507
Introduction to Game Development
Summer 2020

1. Instructor Information

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Office Hours:

2:00 PM – 3:30 PM, Mondays and Tuesdays, or by appointment.

2. Course Description

Introduction to Game Development is an introductory course focused on game development theory and modern practices using MonoGame and Unity game engines with emphasis on educational game development. Topics covered in this course include game architecture, 3D computer graphics theory, user interaction, audio, game physics, animation, artificial intelligence, virtual reality, augmented reality, and mobile development. The developed games can run on a variety of platforms, including personal computers, smartphones, and game consoles.

3. Textbooks

Required:

- J. Hocking, *Unity in Action: Multiplatform Game Development in C#*, Manning Publications, 2018, ISBN-10: 1617294969, ISBN-13: 978-1617294969.
- J. Halpern, *Developing 2D Games with Unity: Independent Game Programming with C#*, Apress, 2018, ISBN-10: 1484237714, ISBN-13: 978-1484237717.
- A. Troelsen and P. Japikse, *Pro C# 7: with .NET and .NET Core*, Apress, 2017, ISBN 1484230175.

Optional:

- J. Gibson, *Introduction to Game Design, Prototyping, and Development: From Concept to Playable Game with Unity and C# (2nd Edition)*, Addison-Wesley Professional, 2017, ISBN 0134659864.

4. Software

- MonoGame 3.7.1
- Unity 2019.3
- Microsoft Visual Studio 2019 Community/Professional/Enterprise Edition
- Android Studio

5. Prerequisites

CS 361 or MSIM 331. Basic mathematical preparations in linear algebra (in particular, matrix operations), geometry, trigonometry, and calculus are required. Students must have previous experience in one of the following languages: C++, Java, or C#. Students also should understand basic data structures, such as trees and graphs. A brief introduction to C# is provided and students are required to write their program in C#. Students without the prerequisites are not permitted to take this course.

6. Lecture Hours

There are no scheduled meeting times for this course. Student will utilize the lectures recorded in Spring 2020. Office hours will be utilized to explain key concepts and theories.

7. Assignments and Grading

The course has homework assignments, 5 programming assignments and one final presentation. Students enrolled in MSIM 508 and ECE 507 will have additional tasks for programming assignments. There are no exams in this course.

Programming Assignment #	Description	Points
1	Introduction to C#	10
2	2D Game in MonoGame	10
3	2D Game in Unity	20
4	3D Game in Unity	25
5	Mobile VR and AR	25
	Homework Assignments	5
	Final Presentation	5

Reading materials and homework problems will be provided but will not be graded.

8. Technical Writing

Writing is one essential communication means for human civilization. Most critical information (e.g., laws and contracts) is required to be recorded in written form. For engineering fields including modeling, simulation, and visualization engineering, writing is important for presenting research ideas and results, documenting user requirements, product design, and implementation, generating user manuals and technical support guides, and product marketing. Writing also help students learn more effectively by making thinking process more explicit with thoughts/ideas presented clearly (or so) in written form, as well as other possible visual cues. In this course, you will write technical reports for

programming assignments to describe the problem, document your software design, explain your work and results, and reflect your learning.

9. University Email Policy

The Old Dominion University e-mail system is the official electronic mail system for distributing course-related communications, policies, announcements and other information. Students should activate their Old Dominion University e-mail accounts and check them before each class. If the student chooses to have his/her messages forwarded to another account, it is the student's responsibility to take the necessary steps to have them forwarded.

10. Withdrawal

A syllabus constitutes a contract between the student and the course instructor. Participation in this course indicates your acceptance of its teaching focus, requirements, and policies. Please review the syllabus and the course requirements as soon as possible. If you believe that the nature of this course does not meet your interests, needs or expectations, if you are not prepared for the amount of work involved or if you anticipate that the class meetings, assignment deadlines or abiding by the course policies will constitute an unacceptable hardship for you, you should drop the class by the drop/add deadline, which is located in the ODU Schedule of Classes.

11. Honor Pledge

By attending Old Dominion University, you have accepted the responsibility to abide by this code. This is an institutional policy approved by the Board of Visitors. The honor code is as follows:

I pledge to support the honor system of Old Dominion University. I will refrain from any form of academic dishonesty or deception, such as cheating or plagiarism. I am aware that as a member of the academic community, it is my responsibility to turn in all suspected violators of the honor system. I will report to Honor Council hearings if summoned.

12. Special needs

In compliance with PL94-142 and more recent federal legislation affirming the rights of disabled individuals, provisions will be made for students with special needs on an individual basis. The student must have been identified, as "special needs" by the university and an appropriate letter(s) must be provided to the course instructor. Provision will be made based upon written guidelines from the university "special needs students" resource office. All students are expected to fulfill all course requirements.

13. Course Disclaimer

Every attempt is made to provide a syllabus that is complete and that provides an accurate overview of the courses. However, circumstances and events may make it necessary for the instructor to modify the syllabus during the semester. This may depend, in part, on the progress, needs, and experiences of the students.

14. Course Outline (Tentative)

The following topics are planned for this course.

1. Course Introduction
2. C#: A Brief Introduction

3. Math Review
4. 2D Games and User Interactions with MonoGame
5. Audio and More 2D Games (MonoGame)
6. Unity Overview
7. Scripting
8. 2D Games with Unity
9. 3D Computer Graphics
10. Game Physics and Navigation
11. Mobile and XR Development
12. User Interface and Audio
13. Animation
14. Student Game Demonstrations and Presentations