COURSE SYLLABUS

CAMOSUN COLLEGE

COURSE TITLE:	Gaming and Graphics Concepts
CLASS SECTION:	ICS 223
TERM:	Winter 2023
COURSE CREDITS:	3
DELIVERY METHOD(S):	classroom & lab

For COVID-19 information please visit https://camosun.ca/about/covid-19-updates

Camosun College campuses are located on the traditional territories of the Lək̓ʷəŋən and W̱SÁNEĆ peoples. We acknowledge their welcome and graciousness to the students who seek knowledge here.
Learn more about Camosun's Territorial Acknowledgement.

Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable explanation in advance, you will be removed from the course and the space offered to the next waitlisted student.

INSTRUCTOR DETAILS

NAME:	Chris Newstead
EMAIL:	newsteadc@camosun.bc.ca
OFFICE:	TEC 247
HOURS:	email to schedule an appointment, or meet anytime after classes/labs.

As your course instructor, I endeavour to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me. Camosun College is committed to identifying and removing institutional and social barriers that prevent access and impede success.

CALENDAR DESCRIPTION

PREREQUISITE(S):
- COM in COMP 104
- COM in ICS 104
- COM in ICS 199

CO-REQUISITE(S):

EXCLUSION(S):

COURSE LEARNING OUTCOMES / OBJECTIVES

- Set up Unity, explain and illustrate how to manipulate/transform GameObjects in the IDE and in code (C#)
- Explain and illustrate how to implement player movement (based on user input), collisions between GameObjects, and physics.
- Develop both 1st and 3rd person player control for a 3D game by following directions and explain the steps in the process.

- Explain and illustrate basic 2D game development concepts.
- Develop a character controller for a 2D platformer by following directions and explain the steps in the process.
- Write OOP code that is organized, uses components, has a hierarchical structure, and is loosely coupled.
- Explain and illustrate how to animate a character using Unity's Mechanim system.
- Develop and explain the process of creating a basic level, and enhancing it with lighting, textures, 3D models, particle systems, and animated non-playing characters (NPCs).
- Develop and explain the process of creating a graphical user interface (GUI) while using an event messenger to keep objects loosely coupled.
- Develop and explain the process of enhancing a game with Artificial Intelligence for NPCs
- Develop a basic Sound Manager and explain the process of adding 2D and 3D audio to a game.
- Design and develop a game demo.

REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

a) Thumb (Flash) Drive preferably USB 3 of at least 8GB (for making backups)

b) Textbook (not required)

Hocking, Joseph. *Unity in Action, Second Edition.* New York : Manning Publishing Co., · March 2018, ISBN 9781617294969.
Currently available free online on the publisher's website:
www.manning.com/books/unity-in-action-second-edition#toc

c) Online Resources

- https://msdn.microsoft.com/en-us/library/618ayhy6.aspx Microsoft's C# Reference

- https://msdn.microsoft.com/en-us/library/67ef8sbd.aspx Microsoft's C# Programming Guide

- http://docs.unity3d.com/2022.1/Documentation/Manual/index.html Unity Online Manual

d) Software

- Unity Hub (latest version)
- Unity (latest production version)
- Visual Studio (2022 Community)
- Github desktop (for version control)
- Gimp (latest version)

e) Other

- Other resources will be provided as the course progresses in the form of video tutorials, online links or handouts.

COURSE SCHEDULE, TOPICS, AND ASSOCIATED PREPARATION / ACTIVITY / EVALUATION

The following schedule and course components are subject to change with reasonable advance notice, as deemed appropriate by the instructor.

WEEK or DATE RANGE	ACTIVITY or TOPIC	OTHER NOTES
Week 1	• Course Intro • Game Industry • What is Unity? Why Unity? • The Unity Visual Editor • Unity Scripts	Lab 1 – Intro to Unity
Week 2	• The Input Manager • Materials • Colliders & Collisions • Physics	Lab 2 – Creating and Lighting a 3D Space
Week 3	• Rigidbody • Kinematic Rigidbodies • Physic Materials • Camera projection (perspective vs orthographic)	Lab 3 – Adding a Player to a 3D Space
Week 4	• Parent child inheritance • Pivot point relocation • Character Controller • 3rd person (movement, gravity, jumping)	Lab 4 – Collisions, Enemies, and Projectiles
Week 5	• Colliders as Triggers • Coroutines • Prefabs (creating, editing) • Moving Platforms	Lab 5 – AI and Prefabs
Week 6	• C#, reference vs value types • Rotation: Vector3 vs Quaternions • Particle Systems • Projectiles	Lab 6 – Making it Pretty
Week 7	**Family Day and Reading break – no classes/labs**	
Week 8	• Finite State Machines • Mecanim • Rigging a 3d model using Mixamo • Animating a 3D model using Mecanim.	Lab 7 – Animations
Week 9	• 2D graphics • SortingLayers vs Layers • Instantiating existing objects • Creating UI buttons • Event Messaging System	Lab 8 – The Retained Mode GUI
Week 10	• 2D Platformer • Sprite Editor • 2D Character Physics • Player Movement/Animation • Controlling the Camera & Parallax scrolling • Tilemaps & Tile Palettes	Lab 9 – Adding an Event System
Week 11	• Parallax scrolling • Tilemaps & Tile Palettes	Lab 10 – Interacting with

WEEK or DATE RANGE	ACTIVITY or TOPIC	OTHER NOTES
	• Pathfinding with NavMesh & NavMeshAgent • NPC AI using a State Machine	Game Objects and Deployment
Week 12	Enemy AI StateMachineBehaviours Properties State Design Pattern	Project
Week 13	Audio: SFX & Music Creating a SoundManager Singleton Design Pattern Mixer	Project
Week 14	Project	Project

Students registered with the Centre for Accessible Learning (CAL) who complete quizzes, tests, and exams with academic accommodations have booking procedures and deadlines with CAL where advanced noticed is required. Deadlines scan be reviewed on the CAL exams page. http://camosun.ca/services/accessible-learning/exams.html

EVALUATION OF LEARNING

DESCRIPTION		WEIGHTING
Quizzes (approx. 4)		40%
Labs (approx. 10)		40%
Project		20%
	TOTAL	100%

If you have a concern about a grade you have received for an evaluation, please come and see me as soon as possible. Refer to the Grade Review and Appeals policy for more information. http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf

(a) Labs

Must complete all labs.
Must achieve a minimum average of 55% on the labs.

Late assignments and/or labs are subjected to an 20% penalty per week, except by the instructor's prior written permission or in the presence of a dire and documented short-term medical or family emergency. Labs are due a week after the lab session in which they are "released" (unless otherwise specified). For example: Lab 1 (which is released in week 1) is due in week 2 (in the regular lab time you have been assigned). Grading is done based on a sample run and visual inspection of the code.

(b) Quizzes

Must complete all quizzes.
Must achieve a minimum average of 55% on quizzes.

(c) Project

<mark>Must achieve a minimum average of 55% on the project.</mark>

COURSE GUIDELINES & EXPECTATIONS

For this course, students will need to have access to a computer capable of running Unity, Visual Studio (PC or Mac), and an internet connection.

If classes are being taught remotely, this course may be completed in an online format. If the course is taken online a webcam is required, and my expectation that students are willing to use their webcams for audio/video communication during individual help or demo situations. I have found that communication is much more effective when both students and instructors are use both audio/video. Please be aware that this will be requested of you if you are being assisted by your instructor in a one-on-one session.

STUDENT RESPONSIBILITY

Enrolment at Camosun assumes that the student will become a responsible member of the College community. As such, each student will display a positive work ethic, assist in the preservation of College property, and assume responsibility for their education by researching academic requirements and policies; demonstrating courtesy and respect toward others; and respecting expectations concerning attendance, assignments, deadlines, and appointments.

SUPPORTS AND SERVICES FOR STUDENTS

Camosun College offers a number of services to help you succeed in and out of the classroom. For a detailed overview of the supports and services visit http://camosun.ca/students/.

Support Service	Website
Academic Advising	http://camosun.ca/advising
Accessible Learning	http://camosun.ca/accessible-learning
Counselling	http://camosun.ca/counselling
Career Services	http://camosun.ca/coop
Financial Aid and Awards	http://camosun.ca/financialaid
Help Centres (Math/English/Science)	http://camosun.ca/help-centres
Indigenous Student Support	http://camosun.ca/indigenous
International Student Support	http://camosun.ca/international/
Learning Skills	http://camosun.ca/learningskills

Support Service	Website
Library	http://camosun.ca/services/library/
Office of Student Support	http://camosun.ca/oss
Ombudsperson	http://camosun.ca/ombuds
Registration	http://camosun.ca/registration
Technology Support	http://camosun.ca/its
Writing Centre	http://camosun.ca/writing-centre

If you have a mental health concern, please contact Counselling to arrange an appointment as soon as possible. Counselling sessions are available at both campuses during business hours. If you need urgent support after-hours, please contact the Vancouver Island Crisis Line at 1-888-494-3888 or call 911.

COLLEGE-WIDE POLICIES, PROCEDURES, REQUIREMENTS, AND STANDARDS

Academic Accommodations for Students with Disabilities
The College is committed to providing appropriate and reasonable academic accommodations to students with disabilities (i.e. physical, depression, learning, etc). If you have a disability, the Centre for Accessible Learning (CAL) can help you document your needs, and where disability-related barriers to access in your courses exist, create an accommodation plan. By making a plan through CAL, you can ensure you have the appropriate academic accommodations you need without disclosing your diagnosis or condition to course instructors. Please visit the CAL website for contacts and to learn how to get started: http://camosun.ca/services/accessible-learning/

Academic Integrity
Please visit http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.13.pdf for policy regarding academic expectations and details for addressing and resolving matters of academic misconduct.

Academic Progress
Please visit http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.1.pdf for further details on how Camosun College monitors students' academic progress and what steps can be taken if a student is at risk of not meeting the College's academic progress standards.

Course Withdrawals Policy
Please visit http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.2.pdf for further details about course withdrawals. For deadline for fees, course drop dates, and tuition refund, please visit http://camosun.ca/learn/fees/#deadlines.

Grading Policy
Please visit http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf for further details about grading.

Grade Review and Appeals

Please visit http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf for policy relating to requests for review and appeal of grades.

Mandatory Attendance for First Class Meeting of Each Course

Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable reason in advance, you will be removed from the course and the space offered to the next waitlisted student. For more information, please see the "Attendance" section under "Registration Policies and Procedures" (http://camosun.ca/learn/calendar/current/procedures.html) and the Grading Policy at http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf.

Medical / Compassionate Withdrawals

Students who are incapacitated and unable to complete or succeed in their studies by virtue of serious and demonstrated exceptional circumstances may be eligible for a medical/compassionate withdrawal. Please visit http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.8.pdf to learn more about the process involved in a medical/compassionate withdrawal.

Sexual Violence and Misconduct

Camosun is committed to creating a campus culture of safety, respect, and consent. Camosun's Office of Student Support is responsible for offering support to students impacted by sexual violence. Regardless of when or where the sexual violence or misconduct occurred, students can access support at Camosun. The Office of Student Support will make sure students have a safe and private place to talk and will help them understand what supports are available and their options for next steps. The Office of Student Support respects a student's right to choose what is right for them. For more information see Camosun's Sexualized Violence and Misconduct Policy: http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.9.pdf and camosun.ca/sexual-violence. To contact the Office of Student Support: oss@camosun.ca or by phone: 250-370-3046 or 250-3703841

Student Misconduct (Non-Academic)

Camosun College is committed to building the academic competency of all students, seeks to empower students to become agents of their own learning, and promotes academic belonging for everyone. Camosun also expects that all students to conduct themselves in a manner that contributes to a positive, supportive, and safe learning environment. Please review Camosun College's Student Misconduct Policy at http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.5.pdf to understand the College's expectations of academic integrity and student behavioural conduct.

Changes to this Syllabus: Every effort has been made to ensure that information in this syllabus is accurate at the time of publication. The College reserves the right to change courses if it becomes necessary so that course content remains relevant. In such cases, the instructor will give the students clear and timely notice of the changes.