COURSE OUTLINE

2024/2025

COURSE NAME: Game Programming Essentials
COURSE CODE: DMIT1514

COURSE DESCRIPTION

Object-oriented programming is an essential video game development skill. An object-oriented programming language and a game framework will be used to develop an understanding of game programming in the 2D game space. The students will custom-build their own 2D games, with an emphasis on object-oriented design principles.

Course Credits: 4.50
Pre-requisites: CPSC1012
Equivalent Courses: DMIT163

LEARNING OUTCOMES

OUTCOME	Upon successful completion of this course, you will be able to
1	Explain the integrated development environment and 2D game programming framework The following concepts, skills, and issues are used to support this Outcome: • Discuss the role and order of execution of the Update and Draw methods in the 2D Game Framework • Code games that alter game states with the Update method and draw to the screen using the Draw method • Code 2D games using the asset pipeline in the 2D Game Framework • Use the Integrated Development Environment debugger
2	Program an executable that displays graphics and animations The following concepts, skills, and issues are used to support this Outcome: • Display sprites and animations in the 2D Game Framework • Discuss and/or develop custom classes to handle animations • Code 2D games that integrate sprites and animations throughout
3	Program simple games that incorporate basic physics and collision detection The following concepts, skills, and issues are used to support this Outcome: • Code game objects that move, collide with walls, and collide with other game objects • Write classes that communicate with one another in response to collisions

4	Program a game that integrates user input, game rules, motion, collision detection and game states The following concepts, skills, and issues are used to support this Outcome: • Game states and rules • Using enumerations to maintain game state information • Keyboard and mouse input • Using switch statements to react to and update game logic and draw states • Animations and sprites
5	Apply and explain the concepts of encapsulation, inheritance and polymorphism in object oriented programming The following concepts, skills, and issues are used to support this Outcome: • Examine the bundling of data and methods • Apply restrictions to the access of object components • Examine the reasons for code reuse • Create a single method that has multiple functions • Combine the common behaviour and data of two classes into a parent class from which they both inherit • Examine the concept of polymorphism in the context of object-oriented programming

STUDENT EVALUATION

OUTCOME	ACTIVITY DESCRIPTION	MARK DISTRIBUTION
1 and 2	Lab 01 - Animation and Inputs	10%
1 and 2	Lab 02 - Data Structure And Program Flow	10%
1, 2, 3 and 4	Lab 03 - Simple Movement and Collisions	20%
1, 2, 3 and 4	Lab 04 - Encapsulation	20%
1, 2, 3, 4 and 5	Lab 05 - Inheritance and Debugging	20%
1, 2, 3, 4 and 5	Lab 06 - Code Reuse	20%
	TOTAL	**100%**

COURSE COMPLETION REQUIREMENTS

A minimum passing grade of 50% is required

STUDENT EQUIPMENT AND SUPPLIES

DMIT has implemented bring your own device (BYOD). Please ensure you have a laptop with the minimum specifications for your area of concentration. See the NAIT/DMIT website for concentration laptop requirements.

Additional Software Requirements

All required hardware and software will be provided in onsite labs at NAIT. However, for work offsite of the NAIT campus, students must have recent versions of Monogame and Microsoft Visual Studio.

STUDENT RESPONSIBILITY

It is expected that students will be responsible citizens of the Institute by following the Student Rights and Responsibilities Policy(SR 1.0). As such, each student will assist in the preservation of Institute property, and assume responsibility for their education by staying informed of and abiding by academic requirements and policies; demonstrating respect toward others; and meet expectations concerning attendance, assignments, deadlines, and appointments.

EQUITY AND INCLUSION STATEMENT

NAIT is committed to advancing equity and to actively and intentionally creating learning environments that promote a sense of belonging and dignity that ensure all people are safe, respected and valued. Acknowledging that every member of the NAIT community has a role in and responsibility to this work, NAIT provides the resources and support necessary for programs, departments and individuals to champion equity, diversity and inclusion and address barriers in meaningful ways.

TERRITORIAL ACKNOWLEDGEMENT

At NAIT, we honour and acknowledge that the land on which we learn, work and live is Treaty Six territory. We seek to learn from history and the lessons that have come before us, and to draw on the wisdom of the First Peoples in Canada. Only through learning can we move forward in truth and reconciliation, and to a better future together.

Leadership Review Date: June 19, 2023

Changes to This Course Outline: Every effort has been made to ensure that information in this course outline is accurate at the time of publication. The Institute 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.

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