

## Video Game Development

### PROGRAM OBJECTIVES

The Video Game Development program offers curriculum designed to support a team approach to game development. This team environment is a ‘must have’ in the gaming industry. Game creation requires a combination of skills, including programming, scripting, game level planning, and design. Our program content provides courses that support all of these skills. Students will have the opportunity to learn, think and respond within a team, by alternating in each varying role.

Portfolio development is also an important part of our program. A well-developed portfolio is a must for employment interviews. Students will complete multiple gaming projects while enrolled in the program: a game prototype, a C++ game, an HTML5 game, a DirectX game, several Unity Games, and several mobile games that will contribute to their portfolios.

### CAREER OPPORTUNITIES

Career opportunities for graduates include entry-level employment as Quality Assurance/Game Testers, 2D/3D Game Programmers, Mobile Game Programmers, AI Programmers and Level Designers.

*Note: Some career and education options may require advanced degrees, further training or experience.*

### PREREQUISITES

1. Student has Grade 12 or equivalent or meets criteria for Mature Student Status.
2. Mature students must be 19 years of age, pass a qualifying test, and provide a Letter of Intent OR resume that supports their skills and aptitudes to be successful in the program.
3. The approved qualifying test for this program is the Wonderlic test. A passing score for this program is 20.

### GRADUATION REQUIREMENTS

A student must attain an overall average in each module of at least 70% in order to graduate and receive a diploma. A student must complete all requirements of Student Success Strategies as well as the Field Placement requirements for this program.

### PROGRAM OVERVIEW

Course	Hours
Student Success Strategies	20
Digital Literacy for Professionals	40
Video Game Design	80
Math & Physics for Games	80
Rapid Game Development	80
Digital Media & Portfolios	80
Fundamentals of Game Programming	80
Advanced Game Programming	80
Fundamentals of Graphics Programming	80
Advanced Graphics Programming	80
Game Engines I 2D	80
Game Engines I 3D	80
Game Engines I Project	160
Game Engines II 2D	80
Game Engines II 3D	80
Game Engines II Project	160
Career Planning and Preparation Level I	20
Career Planning and Preparation Level II	20
Video Game Field Placement	16 weeks

### TOTAL DURATION

**85 weeks**

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## COURSE DESCRIPTIONS

### Student Success Strategies

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In this orientation module, you will focus on achieving success from day one. You will develop non-technical skills to enhance your personal, academic, and career success. You will explore learning styles, including visual, auditory, and kinesthetic learning. You will also enhance your practical study skills, such as memory, reading, note- and test-taking techniques. Personal exercises will focus on teamwork, decision-making and problem-solving skills, setting SMART goals, and maintaining a positive attitude. You will also explore techniques for managing change, stress, and conflict.

### Digital Literacy for Professionals

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This course has four units that introduces you to the fundamental concepts and principles of learning and working in a digital environment. The first unit introduces you to using devices and handling information with topics on operating systems (Windows, MAC, and Linux), computer organization (folder management and naming conventions), cloud storage (including Microsoft OneDrive), types of web browsers including Google Chrome, Mozilla Firefox, and Apple Safari), and fundamental troubleshooting. In the second unit, you will become familiar with creating and editing information through learning about file formats (pdf, mp4, docx), productivity (including iWork and Microsoft Office Suite) and creativity (Adobe, Canva, iMovie) platforms, and basic introduction to Microsoft Word, Excel, and PowerPoint. The third unit on communicating and collaborating will introduce you to web conferencing applications (Slack, Zoom, Microsoft Teams), mail applications (including Microsoft Outlook and Gmail), project management tools (Trello, Asana), and time management tools (including Todoist, Outlook Calendar, and iCal), and building rapport virtually. In the final unit, you will gain an understanding on netiquette, cybersecurity, and digital wellness. After completing this course, you will have enhanced digital literacy skills as a professional in the working and learning environment.

### Video Game Design

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This course introduces students to the historical development of video games and the social and cultural effects video games have on society. An analysis of existing video game mechanics, technical design, documentation, planning, and implementation will allow students to approach video game design from a knowledge perspective. Students will generate game design documentation for both existing and their own video games.

### Math and Physics for Games

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In this course, students will identify key mathematical and physics concepts found in video games. Students will recognize and interpret these concepts as they are applied to video game processes. Students will work through specific math and physics concepts used in most games and game engines.

### Rapid Game Development

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This course provides students with the knowledge and ability to rapidly prototype video game demos to showcase “proof-of-concepts”. Students in this course will also work as a team to apply knowledge and skills mastered to develop a video game prototype. Additionally, students will be mentored throughout the process to relay the skills and thought processes necessary to produce commercial quality video games.

### Digital Media and Portfolios

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This course introduces students to the criteria used to identify and evaluate digital and interactive media and related technologies. Focus will be placed on the practices and tools used to create and maintain an online presence and portfolio within the video game industry.

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## **Fundamentals of Game Programming**

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This course introduces students to programming and various object-oriented problem-solving techniques. Students will identify essential object-oriented terminology and techniques commonly applied to video game development. This course examines the fundamentals of programming and applies those to simple games. This foundation will be built upon in future courses.

## **Advanced Game Programming**

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This course will develop student programming skills and further various object-oriented problem-solving techniques. Students will identify advanced object-oriented terminology and techniques commonly applied in video game development. This course examines more advanced programming and applies this to challenging projects. This course will enhance student capacity to design complex systems and work in a professional video game development environment.

## **Fundamentals of Graphics Programming**

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This course continues where the introduction to programming course left off and builds on those foundations. Students are introduced to the graphics programming pipeline where they will learn how to identify and select the right rendering subsystem for their games based on platform and requirements. Students will be designing and building more elaborate games which they will have an opportunity to re-visit and improve upon in future courses.

## **Advanced Graphics Programming**

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This course continues where the introduction to graphics programming course left off and builds on those foundations. Students continue to explore additional APIs. Students will develop their skills in using Shaders and apply this to their custom engine project.

## **Game Engines I 2D**

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This course will extend students' knowledge of 2D game programming and development using the Unity game engine and the C# programming language. Students will learn how to work with the Unity Engine which will allow them to develop and publish 2D games that can be targeted to multiple platforms including mobile devices.

## **Game Engines I 3D**

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This course will extend student knowledge of the Unity Engine and 3D game programming for video games. Students will apply their knowledge of the Unity Engine as they expand into the 3rd dimension. Mathematics and physics principles learned earlier will be applied to create and publish fully functional 3D games using the Unity Engine and the C# Programming language.

## **Game Engines I Project**

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Students in this course work as a team to apply knowledge and skills mastered in Video Game Design, Business & Organization, Engines I 2D, and Engines I 3D courses to develop a Unity video game of choice. Students will be mentored throughout the process to produce commercial quality video games.

## **Game Engines II 2D**

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This course will extend student knowledge of 2D game programming and development using the Unreal game engine, Blueprints, and C++ programming language. Students will learn how to work with the Unreal Engine which will allow them to develop and publish 2D games that can be targeted to multiple platforms including mobile devices.

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## Game Engines II 3D

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This course will extend student knowledge of the Unreal Engine and 3D game programming for video games. Students will apply their knowledge of the Unreal Engine as they expand into the 3rd dimension while still leveraging blueprints. Mathematics and physics principles learned earlier will be applied to create and publish fully functional 3D games using the Unreal Engine and the C++ Programming language.

## Game Engines II Project

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Students in this course work as a team to apply knowledge and skills mastered in Video Game Design, Business & Organization, Engines II 2D, and Engines II 3D courses to develop an Unreal video game of choice. Students will be mentored throughout the process to produce commercial quality video games.

## Career Planning and Preparation - Level I

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This module will introduce you to and provide practice in using the tools required for a successful job search. The concepts covered in this module will help you maintain a career-focused approach throughout your studies so that you are better prepared to conduct a job search after graduating. Specifically, you will learn how to identify your soft and hard skills and how to articulate your abilities in a clear and concise Elevator Pitch that will appeal to employers and resonate with industry contacts. You will learn about the job search resources available to you including using career websites, creating Linked In profiles, accessing the “hidden” job market, and networking. You will examine sample resumes and cover letters and begin the process of creating your own professional resumes and cover letters that align with current conventions for content, organization, and formatting. You will also learn about the role of references, thank you letters, workplace philosophies, and strategies for success including maintaining a professional image and using proper etiquette when communicating with potential employers and industry contacts.

An introduction to Occupational Health and Safety is also provided with specific focus on employees’ rights and responsibilities, workplace health and safety policy and programs, hazard identification and control, and safety training options such as WHIMIS and First Aid.

## Career Planning and Preparation - Level II

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This module builds on concepts and skills introduced in the Career Planning and Preparation Level 1 prerequisite module. In this subsequent module, you will update and refine your resume and Linked In Profile. You will continue writing cover letters and learn the value of customizing cover letters to specific job postings. You will have the opportunity to apply this knowledge as you conduct a job search and write a cover letter tailored to an ideal job post. Through research, you will create a list of top employers and target current industry opportunities. You will learn about current methods for applying to job postings using technology. You will also gain an understanding of the job interview process, typical interview questions and possible responses, and expectations of both the interviewer and interviewee. In addition, you will engage in practical application of the interview process through role-plays. Topics such as negotiating salary, self-management, and on-the-job success for placements and post-graduate employment will be also covered.

## Video Game Field Placement

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At the successful completion of the classroom hours of this program, students will be placed in a 400-hour/16-week internship at Video Game development related organization. Students will have the opportunity to apply their new and developed skills in a real-world environment. Host sites include businesses and organizations which have an online presence and are engaged in software, game and/or interactive media design, development and testing.

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