Video Game Design & Development

PROGRAM OBJECTIVES

The Video Game Design and 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 sound 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 8 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

- High school diploma or equivalent, or mature student status
- Successful completion of entry examinations

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	Duration (hours)
Student Success Strategies	20
Software Lab - Computer Fundamentals	40
Video Game Analysis and Technical Design	80
Digital Media	40
Video Game Math and Physics	120
Video Game Prototyping	80
Introduction to C++ Game Development	160
Mobile Game Development for Android	120
Mobile Game Development for Apple iOS	120
Unreal Video Game Development	160
Unreal Video Game Project	80
2D Unity Video Game Development	80
3D Unity Video Game Development	80
Unity Video Game Project	80
3D Asset Creation for Video Games	60
Video Game Sound	20
Video Game Level Design	80
Advanced HTML5 Game Development	80
Career Planning and Preparation Level I	20
Career Planning and Preparation Level II	20
Field Placement	16 weeks
TOTAL DURATION	**93 weeks**

COURSE DESCRIPTIONS

Student Success Strategies

In this orientation module, emphasis is placed on thinking about achieving success from Day One. This module stresses the importance of developing non-technical skills to enhance personal, academic, and career success. This includes understanding learning styles and honing 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; techniques for managing change, stress and conflict will also be explored.

Software Lab: Computer Fundamentals

Through a combination of theory and hands-on-practice, this module examines the role and use of the computer in today's workplace. Emphasis is placed on those computers outfitted with the Microsoft Windows operating system. Students will review basic computer concepts, Windows OS usage, and complete hands-on training exercises in business-standard software applications, including Microsoft Outlook and Microsoft Word. Keyboarding skills are also honed via daily keyboarding exercises and drills.

Video Game Analysis and Technical Design

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 and implementation will allow students to approach video game development from a technical perspective.

Digital Media

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 within the video game industry.

Video Game Math and Physics

This course identifies key mathematical and physics concepts found in video games. Students will recognize and interpret these concepts as they are applied to specialized video game processes.

Video Game Prototyping

This course provides students with the knowledge and ability to rapidly prototype video game demos using HTML5/Javascript 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.

Introduction to C++ Game Development

This course introduces students to the C++ programming language and various object-oriented problem-solving techniques. Students will identify essential object-oriented terminology and techniques commonly applied to video game development. More specifically, this course is divided into two major parts: the first part examines basic C++ programming concepts and applies those to console games; the second part focuses on the data structures, algorithms and Standard Template Library (STL) classes that are commonly used in game programming.

Mobile Game Development for Android

In this course, students learn how to develop mobile games in Java for use on the Android mobile platform. Students in this course will also work as a team to apply knowledge and skills mastered to develop and optimize a mobile Android video game. Additionally, students will be mentored throughout the process to relay the skills and thought processes necessary to produce commercial quality mobile video games.

Mobile Game Development for Apple iOS

In this course, students will learn how to build 2D games for the Apple iOS platform (iPhone/iPad) using the Apple Swift programming language within the Xcode IDE. Students in this course will also work as a team to apply the knowledge and skills mastered to develop a video game prototype that can be showcased within an online portfolio. Additionally, students will be mentored throughout the process to relay the skills and thought processes necessary to produce commercial quality mobile games for iOS.

Unreal Video Game Development

This course will extend students' knowledge of C++ programming using the Unreal engine/SDK. Students will focus on the development, mathematical, and physics skills necessary to create 2D and 3D Unreal games, as well as apply their skills to an Unreal game project.

Unreal Video Game Project

Students in this course work as a team to apply knowledge and skills mastered in the Unreal Video Game Development courses to develop a Windows video game of choice. Students will be mentored throughout the process to produce commercial quality video games.

2D Unity Video Game Development

This course will extend students' knowledge of 2D programming using the Unity game engine and the C# language. Students will learn how to work with the C# language as well as the skills that will allow them to develop 2D games that could be targeted to multiple platforms.

3D Unity Video Game Development

This course will extend students' knowledge of game programming with Unity's game programming framework. Students will apply the mathematics and physics principles learned earlier to create a fully functional 3D game using Unity and C#.

Unity Video Game Project

Students in this course work as a team to apply knowledge and skills mastered in 2D and 3D Unity Development courses to develop a Unity video game of choice. Students will be mentored throughout the process to produce commercial quality video games.

3D Asset Creation for Video Games

This course introduces students to 3D modeling and animation. Students will be able to create models including anything from a box to a spaceship. They will also learn how to import and export their models into various formats. This is a lab-driven course that provides the opportunity to learn the basics and to develop an advanced understanding of the product and its capabilities through experience.

Video Game Sound

This course will provide all students with a broad introduction to the theoretical, technical, creative and artistic principles of sound and recording as it relates to video game production. The combined theory and practical lab environment will introduce students to digital audio processing, editing, mixing, and importing using Audacity audio production software.

Video Game Level Design

In these series of lessons we will familiarize students with the Source engine SDK and Hammer. We'll explore the various tools within Hammer to create foundational geometry, entities and industry terminology. We will also discuss about functionality, optimization and basic scripting to construct different game scenarios. This is a lab-driven course that provides the opportunity to learn the basics and to develop an advanced understanding of the product and its capabilities through experience.

Advanced HTML5 Game Development

This course examines advanced game techniques using HTML5 and Javascript. In many ways, this course picks up where the Video Game Prototyping course left off and focuses on the development of video games from concept to creation using several features learned in the animation, sound and level design courses. Students in this course will also work as a team to apply knowledge and skills mastered to develop an HTML5/Javascript video game. Additionally, students will be mentored throughout the process to relay the skills and thought processes necessary to produce commercial quality HTML5/Javascript video games.

Career Planning and Preparation Level I

This module introduces tools for planning and preparing for a successful job search, so that students can maintain a career-focused approach throughout their education program. Students will learn about the "Hidden" Job Market and ways to access it in their upcoming job search, how to research opportunities and network for industry contacts, and use appropriate etiquette when communicating with prospective employers. Students will identify their personal skills, values and preferences for the workplace, begin preparation of a professional resume and references, and organize proof documents for their career portfolio. Class discussions on various self-management topics introduced in Student Success Strategies will round out this module, which is a pre-requisite for Career Planning and Preparation - Level II.

Career Planning and Preparation Level II

This module continues to build on the concepts and skills introduced in Career Planning and Preparation - Level I. Students will learn how to conduct an effective job search and identify various methods of applying for work with today's technology. Students will create a personal list of "Top Employers" and target current industry opportunities, while finalizing their professional resume, portfolio and career correspondence. Students will learn to identify the different types and forms of interviews, practice responding to typical questions, and practice follow-up, evaluation and negotiation techniques they can use to ensure success. Self-management topics from Career Planning and Preparation - Level I will be reviewed, with a focus towards on-the-job success in both learner placements and post-graduate employment.

Field Placement

At the successful completion of the classroom hours of this program, students will be placed in a 16-week internship at an outside organization. Students will have the opportunity to apply their new and developed skills in a real-world environment. Host sites include Video Game Developers.