

Video Game Development

Instructor:

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Course Hours:

- Session 1: 8 a.m. – 10:30 a.m.
- Session 2: 11:30 a.m. – 2 p.m.

Description:

Video Game Development explores the many facets of the video game development life-cycle: from asset creation (graphics & sound effects) to game design to coding.

- Design & develop 2D video games with [GameMaker: Studio](#).
- Produce 2D graphics using [paint.net](#) & [GIMP](#).
- Manipulate sound effects (SFX) using [Audacity](#).
- Create 3D games using the [Unity](#) game engine.
- Manage 3D modeling, animation and rendering using [Blender](#).
- Learn programming concepts using the industry-standard [C++](#) programming language.
- Explore core game design concepts.
- Utilize applied higher mathematics for video games.

We pride ourselves on using professional-level freeware so that students can continue their game production at home without the need for expensive software.

Instructional topics/units will be covered (but not limited to):

- Game design – defining what the game will be.
- Game mathematics – calculating algorithms for the game.
- Game assets – providing art and sound assets for the game.
- Game programming – learning C++ and using GML to define the game logic.
- Game development – individually and in teams, creating complete video games.

Key Learning Objectives and Industry Competencies

Upon successful completion of the program, students will be able to:

- Use industry-standard game design terminology and techniques.
- Use applied math to create 2D game engine algorithms.
- Discuss & create game-ready 2D and 3D art and sound assets.
- Understand fundamental programming techniques applicable across a wide-range of computer programming languages.
- Program in C++ using both procedural and object-oriented paradigms.
- Script operable GML (GameMaker Language) game engine components.
- Create game prototypes using the [GameMaker: Studio](#) game engine.

Course Resources

- Game Engines: [GameMaker: Studio](#) & [Unity](#)
- Imaging: [Blender](#) & [paint.net](#)
- Audio: [Audacity](#)
- Programming: [MicroSoft Visual C++ 2010 Express](#)

Suggested Experience (prior to joining the course)

- Algebra 1.
- Computer literacy.

Suggested Materials

- Pen, pencil & eraser.
- Paper: lined & graph.
- Geometry kit: ruler, compass & protractor.
- Headphones.
- USB flash drive.

Professional Standards

Attendance is an important component to learning and employability. The Northwest Career & Technical Academy follows an attendance policy similar to business and industry in that a student is expected to be in full session attendance in order to assure that maximum learning and productivity are achieved.

The standards reflect what all employers expect of their employees:

- Being dependable – Students are to be at school/work every day.
- Being on time.
- Doing a full day's work.

When a student is absent, the absence should be excused by telephone call or in writing.

As the computer game industry adopts a wide variety of dress codes and standards, students are expected to follow normal high school dress codes whilst erring towards business casual.

Credit Opportunities

- High school credits
 - 1.0 Computer Science
 - 1.0 Computer Graphics
 - 1.0 Math (Programming)

 - Or, if attending for a second year (as a Video Game Development Designated Studies student): Computer Science (3 credits)
- Skagit Valley College credits
 - A maximum of 23 credits are available (broken down separately over the two semesters), for students achieving a grade C or higher (under the current Tech Prep articulation agreement).
 - Articulated courses and their credits:
 - MIT 105 – Two-Dimensional Level Design I (5 credits)
 - MIT 205 – Two-Dimensional Level Design II (5 credits)
 - MIT 115 – Introduction to Scripting & Programming I (4 credits)
 - MIT 215 – Introduction to Scripting & Programming II (4 credits)
 - MIT 235 – User Interface Design (5 credits)

Grades, Grading Scale, and Job Readiness

- Whilst the grading system necessarily devolves into a numeric value (see the Grading Scale, below), students are graded using a standards-based philosophy, matching the following descriptions:
 - **4 / A / Exceeding Standard:**
Excellent work that demonstrates a clear and full understanding of the material, and a professional level of effort in completing all of the set tasks. In some manner the work exceeds expectations or is highly polished.
 - **3 / B / Meeting Standard:**
Very good work demonstrating clear understanding of the material. Perhaps there is a demonstrable lack of a fuller effort, or some minor flaws in wider understanding. Doing exactly what was asked, but nothing more.
 - **2 / C / Approaching Standard:**
Good work demonstrating understanding of the building blocks that are required to complete a fuller solution. Perhaps some tasks are incomplete, or there is a demonstrable lack of effort, or there are some key flaws in the understanding.
 - **1 / D / Below Standard:**
Satisfactory work demonstrating some understanding of at least the basic principles being taught. Many tasks may remain incomplete, or there may be a marked lack of effort in completing the work, or there will be several key flaws in the understanding. Only some of the building blocks required to demonstrate the standard are understood.
 - **0 / F / NC - No Credit:**
The "No Credit" grade covers many bases, from a complete failure to attempt the work (often due to absence), to a demonstrable failure to understand the basic principles being taught. The simplest of the given tasks for that day remains incomplete or the attempt indicates a clear lack of understanding, engagement or effort.

Late Work Policy

Late work may be submitted 48 hours after the deadline. It is expected that late work be carried out as homework.

For extended periods of absence, a personal success plan will be discussed that can measure the students ability against a streamlined set of core competencies.

Re-Do Policy

Grades may be re-evaluated or extra credit may be received where a student clearly demonstrates completion of previously ungraded work, or completion of clearly superior work. Where a time constraint (such as a district deadline for submission of grade) comes into play, there is a limit to how much re-do work can be evaluated.

Extra Help

Students have access to a self-study guide that outlines the free software resources that they can install on their (Windows) home computers.

Professional and Industry Behavior Expectations

All students at the Academy will be responsible for the rules and expectations laid out in the Student/Employee handbook. The handbook can be downloaded from the website at: <http://www.nwtech.k12.wa.us/> (under Students & Parents).

In addition to the overall Academy expectations, in the computer lab the following is expected:

- No drink and no food. Lockers are available outside the classroom.
- No use of mobile devices (e.g. mobile phones) or music players.
- Professional computer use is for work-related activities only.

Next Step

After successful completion of the Video Game Development course, students have some great opportunities to continue their education, having experienced a broad range of skills encompassed within the broader scope of game development.

Students will know whether programming in general is for them, or game programming in particular. At the same time, they'll have gained valuable insights into 2D and 3D computer graphics, game design and software development.