2D Game Programming

General Information

Description

In this course, students will create 2D games using online coding resources used by professional game designers. Along with learning how to create their own game, students will also learn professional concepts and vocabulary used by programmers and game developers.

Expectations and Outcomes

Here are some additional outcomes:

- Students will create accounts and save work online.
- Students will create animation sequences, storyboards, and create various artifacts to make their games come alive.
- Students will create variables, assign values, and use these variables to control the flow of the game.
- Students will build various game logic to create neat tricks within their games.
- Students' math and technology skills will improve.

Course Materials

Prerequisites

- None

Device Requirements

Any device with Internet connection is sufficient.

Additional Information and Resources

Course Length	Delivery Method	Recommended Age Group
30 hours / ½ Semester	Online / Classroom	Middle School (Ages 11 – 14)

Standards Aligned

CSTA
ISTE
K-12 Framework
Common Core

Attention to Equity and Diversity

Rex Academy is dedicated to bringing this course to all interested students, regardless of their background or the zip code in which they reside.

As such, special attention has been given to the curriculum in the following manner:

1. Rex Academy's 2D Game Programming content can run on any device (Chromebooks, tablets, phones, PCs, etc). The Internet connection needs to be minimal. We are determined to remove all obstacles for access.
2. There are a large variety of projects to be built in this course which caters to a wide range of learners and their personal talents.
3. The course can be conducted in a direct classroom setting or in an after-school environment. Students can build games together or individually.
4. Instruction and assessment are performed in various ways, thus accommodating various learning styles.

Interdisciplinary Instruction

Rex Academy combines technology instructional materials with common core alignment to infuse other disciplines into the curriculum.

In 2D Game Programming, heavy elements from Algebra are infused into the curriculum. Students will have to become knowledgeable about the (x, y) coordinate system in a flat plane. Additionally, they will have to figure out various variable values using algebraic equations.

Finally, designing games requires innovation and creativity. Students will create characters, levels, and other artifacts that stretch beyond computer science.

Course Syllabus

Unit Number	Topic	Brief Description
Lesson 1	Basic Platformer	We get right into it. The first game built is a traditional Mario-style platformer with lots of traps and enemies!
Lesson 2	Starfighter	Students build a game where enemies attack from all sides and must be shot down. Survival is the key!
Lesson 3	Tank Wars	In this game, students will create mazes and navigate "tanks" through them. They will control 1 of 4 tanks. The mission is to gun down the other tanks as many times in one round as possible.
Lesson 4	Maze Runner	This game is similar to the platformer that was built for the first project. However, instead of jumping on enemies, students will avoid traps, collect coins, and maneuver around enemies to reach our destination.

Unit Number	Topic	Brief Description
Lesson 5	Asteroids	As asteroids fall from the sky, students will control a hero that must dodge and shoot them down before too many arrive.
Lesson 6	Rex Academy Pong	The old classic game with a Rex Academy twist: 2 balls that progressively get faster.
Lesson 7	The Math Adventure	Students will create an RPG type setting with the challenge of solving math puzzles to advance through the game.
Lesson 8	Dice Toss	Players take turns tossing two dice to see who can get to 100 first without going over.
Lesson 9	Bat Hunt	Bats appear from all different directions. It's up to students to shoot them down. The bats get fast and furious pretty quickly. Students need quick fingers to be able to click on them.
Lesson 10	Create Your Own Game	Students in the class will brainstorm, develop, and deploy a game built from scratch.