**Keiser University Workshop  
Course** **Syllabus**

**Introduction to Computer Programming: Game Development**

**Prerequisites:** None

**Professor Qualifications:** Mr. Andrew Harris – e.g., Earned an BS in Education from IUPUI (Indiana University diploma) and an MS in Informatics at IUPUI. (Purdue University Diploma)

**Professor Bio:** Mr. Andrew Harris has a wealth of experience, spanning over two decades teaching various aspects of computer science and programming. He specializes in teaching beginners to program, as well as game, mobile, and web development. Mr. Harris has written over a dozen books on game programming including several titles in the famous “For Dummies” series. His books span multiple languages and technologies, including both client-and-server side web development, game development, and general programming concepts. He has taught internationally in China, FYR Macedonia, Ukraine, and Nicaragua.

**Professor Contact Information:**

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**Zoom:** https://iu.zoom.us/my/andyharris

**COURSE DESCRIPTION**

This course is a fun and interactive introduction to the world of computing and software engineering focused on game development topics. Target audience is high school students interested in technology and game development. As students develop 2D games, text-based games, and 3D games, they will also be exposed to most of the main ideas central to computer programming:

* Variables and basic data types
* conditional logic – if statements and branching
* Iterative logic – various types of loops
* states (an especially important topic in game development)
* reinforcement of basic math principles

**Objectives**After the course, students can:

1. Understand the basic idea of computer programming through game development
2. Meet a few representative game development tools

* Scratch (for 2D games)
* Twine (for text-based games)
* Blender (for creating 3D objects)
* Armory (for building 3D games from within Blender)

1. Students will build at least two projects using each technology
2. Collaborate in other projects using the Moodle discussion forum

**Course Materials:** In this course, you will access to the Moodle platform at <http://aharrisbooks.net/moodle/>. Please, check your email to get your account credentials.

Live session link:

**Grading System:** N/A

**Important Notes:**

The course contains five modules, one module per day. Each day has two sessions, and students must submit one project per session.

* Morning Session (9:00 AM – 12:00 NOON Central Time or Nicaragua Time)
* Introductory Lecture (One hour)
* Working on Morning Project
* Ask Questions
* Present projects
* Afternoon Session (1:00 PM – 4:00 PM Central Time or Nicaragua Time)
* Short Lecture (1/2 hour)
* Working on Afternoon Project
* Ask Questions
* Present projects

**Current Topic Discussion Guidelines:** Please, post any questions or threats in the "Ask Questions Forum" forum. Answers will appear within 24 hours. Instructors will also be online through zoom for interactive help throughout the day.

**COURSE OUTLINE**

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| **DAY ONE: Building Games with Scratch** |
| **Topics:** In this first unit, we explore the notion of precisely what is a game, specifically a computer game. We'll look at some key factors**:**   * Suspension of disbelief * Manipulation of space and time * Stored play * States and transitions   **In Preparation:**   * Scratch Main Site: <https://scratch.mit.edu/> * Scratch Article: "Building Games and Animations with Scratch"<http://www.aharrisbooks.net/TOS/scratchArticle.pdf>   **Assignments**:   * Tell a Joke Project * 2D Arcade Game Project |
| **DAY TWO: Writing Text adventures with Twine** |
| **Topics:** Now that you've learned the basic ideas of programming, we will extend these ideas by building a cool text-based choose-your-own-adventure game.   * We will talk about some principles of game design and show you how to use an amazing online tool called 'twine' to build your own multiple-choice adventure game. * After you've made your first game with this system, we will talk about some more advanced techniques you can use: adding HTML components to add images and sound effects and using basic CSS to change the colors and styles of your story elements. * We'll even cover how programming can be used to add elements like inventories, rolling dice, and basic combat.   **In Preparation:**   * Twine Main Site: <http://twinery.org/> * Twine Demos: * Twine resources: <https://twopiharris.github.io/gameCamp/twine/>   **Assignments:**   * Hypertext Game Project * Scripted Twine Game Project |
| **DAY THREE: Into the third dimension** |
| **Topics:** Modern games often feature 3D graphics. These are much more complicated to build and manipulate than 2D graphics, which are mostly images. Today you learn how to use the free 'blender' software to create several basic 3D models.   * Downloading and installing Blender * Manipulating the 3D environment * Creating primitive objects and applying elementary materials * Using edit mode to create more complex objects * Building a car model * Building a humanoid model * Building a 4-legged animal * Building furniture and architecture * Creating landscapes and environments   **In Preparation:**   * Blender Main Site: <https://www.blender.org/> * Blender Videos: * Getting Started with Blender: <https://youtu.be/DFTy98eVMdw> * Object Transformations: <https://youtu.be/M6vu_ZUxkak> * Building Models from Primitive Meshes: <https://youtu.be/utSz-in5hCA> * Working with Edit Mode: <https://youtu.be/lofs-a7Fw0Q> * Building a Basic Vehicle: <https://youtu.be/tSsvlxVk0tw> * Creating a Humanoid Figure: <https://youtu.be/1h7zYJ1OTcc>   **Assignments**:   * 3D Primitives Image Project * Game Object and Scenery Project |
| **DAY FOUR: Building 3D games with Armory** |
| **Topics:** Once you can build 3D models, you'll want to put them together to make an exciting game. Today we'll use the powerful free Armory 3D plugin to add game development to Blender. Armory supports a logic node programming system, which will allow you to create a fun and interesting 3D version of your game.   * Installing Armory * Working with logic nodes * Adding user input * Detecting collisions * Adding physics   **In Preparation:**   * Online Armory Examples: * Armory Car: <https://twopiharris.github.io/gameCamp/armory/amorCar/build_armorCar/debug/html5/> * Armory First Person Shooter: <https://twopiharris.github.io/gameCamp/armory/armFPS/build_armFPS/debug/html5/>   **Assignments**:   * Driving Game Project * Shooting Game Project |
| **DAY FIVE: Game Jam!** |
| **Topics:** You have learned a lot of great techniques this week. Now that you know some of the tools and concepts, we can get creative and start thinking up and implementing your game ideas. We begin by talking about how to build a game design document, how to come up with a reasonable scope for your game.  The rest of the day will be spent working on games. We will be helping you plan, implement, and troubleshoot your game.  The last hour will be a showcase, where everyone will demonstrate their game to each other. You should be proud of all you have accomplished.    **Assignments**:   * Elevator Pitch – GDD * Game Jam |