

(ID) RCOE INTERMEDIATE GAME SCRIPTING

INDUSTRY SECTOR: Information and Communication Technologies Sector

PATHWAY: Games and Simulations

CALPADS TITLE: Intermediate Games and Simulation (Concentrator)

CALPADS CODE: 8141

HOURS:

Total	Classroom	Laboratory/CC/CVE
165	165	0

JOB TITLE	O*NET CODE	JOB TITLE	O*NET CODE
Software Quality Assurance Analysts and Testers	15-1253.00	Computer Programmers	15-1251.00
Software Developers	15-1252.00	Video Game Designers	15-1255.01
General and Operations Managers	11-1021.00	Chief Executives	11-1011.00

COURSE DESCRIPTION:

RCOE Intermediate Game Scripting allows students to work in teams to develop games or simulations. Students will learn skills such as storyboarding, plot, flow, and using functions. Learning how to implement standard game/simulation strategy and rules of play as well as integrating mixed media appropriate to the game design/simulation will be included. Other topics include design specifications, delivery, rules of play, navigation functionality, scoring, and other special features.

A-G APPROVAL: No

ARTICULATION: None

DUAL ENROLLMENT: None

PREREQUISITES: None

METHODS OF INSTRUCTION

- Direct instruction
- Group and individual applied projects
- Multimedia
- Demonstration
- Field trips
- Guest speakers

STUDENT EVALUATION:

- Student projects
- Written work
- Exams
- Observation record of student performance
- Completion of assignment

INDUSTRY CERTIFICATION:

- NA

RECOMMENDED TEXTS:

- Introduction to Game Design, Prototyping, and Development: From Concept to Playable Game with Unity and C# (author: Jeremy Gibson Bond) 3rd edition/2022 (publisher: Pearson)
- Pearson Publishing (author: Unity)

PROGRAM OF STUDY:

- None identified

I.	UNIT 01: INTEGRATED DEVELOPMENT ENVIRONMENTS	CR	Lab/ CC	Standards
	<p>Students will learn about different software, programming languages, and game engines that are currently industry standard with game development. Research will be conducted to learn about what types of game engines are used, what languages are used within these engines, and why we will be using Unity 3D. After understanding what game engines are, and the current industry standards, students will be introduced to Unity 3D game engine and learn the details of its interface.</p> <p>Key Assignment: Research Project</p> <ul style="list-style-type: none"> • Students research different game development / programming job positions <ul style="list-style-type: none"> • https://www.onetonline.org/ • https://www.indeed.com/ • Google Search (Followed by keyword “Jobs”) • Company / Industry websites • Students will create a presentation and summarize <ul style="list-style-type: none"> • Responsibilities • Requirements <ul style="list-style-type: none"> • Education / Certification / Experience • Games Engines • Programming Languages • Salary • Outlook • Students will then present their project to the class to generate more student knowledge on industry jobs and standards for Game Development 	10	0	<p>Academic: LS: 11-12.1</p> <p>CTE Anchor: Career Planning and Management: 3.4, 3.5 Health and Safety: 6.2</p> <p>CTE Pathway: D1.1, D1.6, D1.9</p>
II.	UNIT 02: GAME DEVELOPMENT BASICS	CR	Lab/ CC	Standards
	<p>In this unit, students will start to learn & use some of the more prominent features offered in the Unity game engine. Some examples include: adding & texturing primitive objects, navigating & integrating objects assets, terrain-creation tools, physics, particle systems, and User-Interface (UI) tools. Students will learn how to properly organize & personalize their layout of the interface, and the specific components within the windows of the interface.</p> <p>Key Assignment Design and/or Create a traversable level using <u>Unity Student Plan</u>:</p> <ul style="list-style-type: none"> • Recognize engine terrain creation tools, • Integrating physics / differentiating object components in the level design and character controller. • Provide & Use assets from online resources while organizing item placement & inventory within the Assets folder to industry development standards. • Create a customized UI screen with Unity Engine UI tools. 	35	0	<p>Academic: LS: 11-12.1</p> <p>CTE Anchor: Problem Solving and Critical Thinking: 5.3 Technical Knowledge and Skills: 10.11</p> <p>CTE Pathway: D2.5, D2.9</p>
III.	UNIT 03: OBJECT ORIENTED PROGRAMMING	CR	Lab/ CC	Standards

	<p>This unit focuses on how the C# programming language ties in with the Unity game engine. Students will understand the difference between the engine on its own, the C# programming language within computer programming, and how Unity utilizes C# with its own terms & library. Students will learn how to create a script within Unity, navigate the Microsoft Visual Studio IDE with their Unity projects, and how to attach these scripts to individual objects. This will also compare students' previous understanding of intro programming fundamentals and how they apply to C#.</p> <p>Key Assignment:</p> <p>Students will be provided with a pre-existing template that contains already established errors. Students must evaluate, debug, and create a simple console program with C# scripts in Unity.</p> <ul style="list-style-type: none"> • Display print statements in the console from different scripts <ul style="list-style-type: none"> • Scripts are attached to specific objects • Students will classify and fix errors by reading error statements, then commenting what error they fixed & how they recognized it. • Students must identify and list the components, attributes, and inheritance of such objects and how they were included in their programming control and event strategies. <p>The final product would be an error-free program that would have scripts attached to the correct objects and would display print statements in the console.</p>	10	0	<p>Academic: LS: 11-12.1</p> <p>CTE Anchor: Problem Solving and Critical Thinking: 5.2, 5.6</p> <p>CTE Pathway: D2.5, D7.3</p>
IV.	UNIT 04: VARIABLES AND DATA TYPES	CR	Lab/CC	Standards
	<p>Students will learn to identify the steps it takes to keep track of vital statistics in Video Games and how the programming environment handles this information. Students will recognize different data types and reflect on the use of variables in Computer Science, emphasizing Video Game play. Students will design visual aids that are necessary to build Video Games and how these tools are used in the industry.</p> <p>Key Assignment:</p> <p>Final Product: Students will pseudocode the 4 abilities (skill that the player-character is capable of doing & will positively impact their game) with all the necessary information: Name, Data Type, Initial Value, Updated Value, Cooldowns, Triggers, Etc. Students will then create a flow chart for two of these abilities and present this to the class. One Example would be:</p> <ul style="list-style-type: none"> • Ultimate <ul style="list-style-type: none"> • Strength (Integer, Initial Value - Varies by Character, Updated Value - +20 Points) • Health (Integer, Initial Value - Varies by Character, Updated Value - +20 Percent) • Regeneration (Boolean, Initial Value is False, Updated True) • <u>Flow Chart Example</u> <p>This will integrate the concepts students learned in Systems Programming 01 - Fundamentals of Programming course to plan their code with visual layout & decomposition using pseudocoding & flowcharting, which will tie into the following unit.</p>	10	0	<p>Academic: LS: 11-12.1</p> <p>CTE Anchor: Technology: 4.3 Problem Solving and Critical Thinking: 5.4, 5.5</p> <p>CTE Pathway: D3.1, D6.5</p>
V.	UNIT 05: LOGIC STRUCTURES AND OPERATORS	CR	Lab/CC	Standards

	<p>In programming, one of the most important concepts to understand is how to trigger an event to happen when a condition is met. Students will learn different methods used to check for all different types of conditions and scenarios that can happen in a game, and how to determine what strategy to use in each scenario. Students will understand repetition methods with looping, and checking for specific conditions using operators.</p> <p>Key Assignment</p> <p>Students will be provided a template in Unity that will have character classes and values. Students must then recall and integrate the information from Unit 04 and design and create the two abilities that they created flowcharts for.</p> <p>Students must:</p> <ul style="list-style-type: none"> • Create all the necessary Variables with the correct data types • Initialize these variables based on Character Class (which is in the given template) • Create timers and triggers for their abilities • Update their variables when abilities are triggered • Provide comments for everything <p>The final product would be a working program where when the abilities are triggered, there will be print statements in the console providing the initial and updated states of the variables and the values of the timers during ability activation.</p>	10	10	<p>Academic: LS: 11-12.1</p> <p>CTE Anchor: Communications: 2.4 Problem Solving and Critical Thinking: 5.7, 5.8</p> <p>CTE Pathway: D4.4, D4.7</p>
VI.	UNIT 06: FUNCTIONS	CR	Lab/CC	Standards
	<p>Students understand the basics of how to implement conditions and events in their game, but how do they stop code from repeating constantly? This unit focuses on taking code and condensing it into “functions”, which contributes to code organization and a more optimized repetitive process. With functions, they will also understand how to pass information back & forth, and why it’s a more efficient process than what we have done previously. This unit will also recall previously learned concepts of functions from previous course(s).</p> <p>Key Assignment</p> <p>Students will finish an incomplete prototype of a 3D platformer started as a class</p> <ul style="list-style-type: none"> • Determine & integrate rules which expand on what was already created as a class, as a finished & playable prototype. <ul style="list-style-type: none"> • Provide win & loss conditions • Recycling code for overlapping usage • Provide objects that both call upon functions within the same script, and call functions from other objects using script references. Students demonstrate ability to differentiate, determine, and assemble function types & calls. <ul style="list-style-type: none"> • different uses of function calls with parameter / argument usage • object reference having a direct impact on the prototype gameplay. <ul style="list-style-type: none"> • ie. damaging an object’s health, utilizing a game manager script, score increase, etc • Assessment will be based on user’s gaming experience, which will include, but not limited to: <ul style="list-style-type: none"> • Gameplay 	20	0	<p>Academic: LS: 11-12.1</p> <p>CTE Anchor: Communications: 2.8 Problem Solving and Critical Thinking: 5.9, 5.12</p> <p>CTE Pathway: D2.10, D7.5</p>

	<ul style="list-style-type: none"> • Art design & graphics • Challenge (flow) • Coding <p>The final product would be a completed and playable game utilizing conditionals, multiple different function calls, and flow control which would provide the end-user with a pleasurable gaming experience (which would be whole-class peer review).</p>			
VII.	UNIT 07: GAME ENGINE ARCHITECTURE	CR	Lab/CC	Standards
	<p>Students will exhibit the ability to deconstruct and analyze a broken product. Students will demonstrate true understanding of how and why games work and the ability to fix them and/or make them even better. Working in a group setting will help them understand what it takes to collaborate, discuss, and delegate tasks needed to solve a problem. This will also teach students about the process of working in a group on one Unity project, also known as “Source Control” in Computer Science. Students will then present their finished product with full confidence in their abilities.</p> <p>Key Assignment</p> <p>Students will be given a previously working program that is intentionally broken by the instructor. This program will be more robust and sophisticated based on previous projects and will test how much they have learned up to this point.</p> <p>A final product will consist of the following tasks:</p> <ul style="list-style-type: none"> • As a team, students will deconstruct a broken project • Students will assign design and document a plan to effectively fix errors and code necessary to assemble an alpha release of a product <ul style="list-style-type: none"> • Types of plans: Job Tasks, “Divide and Conquer”, Group Review & Evaluation, Etc • Students must identify and determine errors in different aspects & categories. They will be adding these errors to the existing plan of action. • Students will then present a reflection on their process of repairing the game, which will include the strategies & approaches they used. • Students will demonstrate proficiency in each category of the Unit 07 Overview/Narrative. 	15	15	<p>Academic: LS: 11-12.1</p> <p>CTE Anchor: Responsibility and Flexibility: 7.3, 7.4 Leadership and Teamwork: 9.2, 9.3</p> <p>CTE Pathway: D2.6, D2.1, D3.4</p>
VIII.	UNIT 08: FINAL PROJECT	CR	Lab/CC	Standards
	<p>Students will assemble and create their own idea for a game. Students will be integrating the Software Development Life Cycle (learned in a previous course) with their own idea for a game and will experience going through a prototyping game development process. Documentation, milestone progress, design methods, and post-mortem will all be integrated into this project.</p> <p>Key Assignment</p> <p>Students, in groups or individually, will Design and Create a functioning prototype either original or based on an existing Intellectual Property (IP) from a blank project.</p> <p>Students will be using the Software & Game Development Life Cycle, which includes: planning, documentation, design, development, testing, implementation, analysis, and maintenance.</p> <p>Students will also have a concept design document, a team contract (including solo projects), and present milestones biweekly of their progress.</p> <p>The final product will be a playable prototype game utilizing all topics covered</p>	40	0	<p>Academic: LS: 11-12.1</p> <p>CTE Anchor: Problem Solving and Critical Thinking: 5.10 Responsibility and Flexibility: 7.5 Leadership and Teamwork: 9.7</p> <p>CTE Pathway: D2.2, D2.3, D3.2, D3.3</p>

	in class units, and demonstrates flow control which would provide the end-user with a pleasurable gaming experience. Students will then add this project to an industry-standard portfolio (Github, Itch.io, portfolio website).			
IX.	UNIT 09: RCOE COLLEGE AND CAREER TRANSITION PLAN (CCTP)	CR	Lab/CC	Standards
	<p>This unit of instruction links student interests to potential careers through exploration and research. Students will develop a post-secondary career plan that identifies and maps out a course of action which incorporates college and career opportunities. Within the twelve (12) topics, students will complete interest surveys, career related documents (i.e., applications, resumes, letters of introduction, letters of recommendation), and mock interviews with the express goal of preparing students to graduate from high school academically and socially prepared for college, the workforce, and civic responsibility. Additionally, students will analyze the importance of financial literacy through topics such as credit, creating a budget, and saving and investing.</p> <p>Lessons:</p> <ul style="list-style-type: none"> • Work, Job, and Career • The Career Plan • Job Applications (Portfolios – Part 1) • The Letter of Introduction (Portfolios – Part 2) • Resume (Portfolios – Part 3) • Letters of Recommendation (Portfolios – Part 4) • Interviewing • Career Research and Reflection • Financial Literacy (Part 1 – The Basics) • Financial Literacy (Part 2 – Credit) • Financial Literacy (Part 3 – Creating a Budget) • Financial Literacy (Part 4 – Saving and Investing) <p>Key Assignment</p> <ol style="list-style-type: none"> 1. RCOE College and Career Transition Guide: This project will incorporate the development of a 5-10 year career plan, preparing a portfolio (letter of introduction, resume, and letters of recommendation), and practicing job applications and mock interviews. 2. Financial Literacy: This project will include identifying elements and deduction on a paycheck, research loan options based on credit worthiness, creating a budget, and planning for retirement. 	15	0	<p>Academic: LS: 11-12.1</p> <p>CTE Anchor: Career Planning and Management: 3.1, 3.2, 3.4, 3.9</p> <p>CTE Pathway: D1.3, D1.5, D2.4</p>
X.	ASSESSMENTS	CR	Lab/CC	Standards
	<p>1st Semester Common Assessment</p> <p>Fill in the blank / Multiple choice assessment on terminology & code scenarios</p> <ul style="list-style-type: none"> • Unity 3d Engine terms <ul style="list-style-type: none"> • Windows, Components, Objects • Visual Studio C# / programming fundamental terms • Code examples <ul style="list-style-type: none"> • Explain statement / function depicted • Explain what error is being shown 	0	0	<p>Academic: LS: 11-12.1</p> <p>CTE Anchor: Communications: 2.1</p> <p>CTE Pathway: D1.1</p>

	<p>Final Common Assessment</p> <p>Students, in groups or individually, will Design and Create a functioning prototype either original or based on an existing IP from a blank project.</p> <p>Students will be using the Software Development Life Cycle, which includes: planning, analysis, design, development, testing, implementation, and maintenance.</p> <p>Students will also have a concept design document, a team contract (including solo projects), and present milestones biweekly of their progress.</p> <p>The final product will be a playable prototype game utilizing all topics covered in class units, and demonstrates flow control which would provide the end-user with a pleasurable gaming experience. Students will then add this project to an industry-standard portfolio (Github, Itch.io, portfolio website)</p>			
XI.	COURSE NOTES	CR	Lab/ CC	Standards
	<p>Course Code/Transcript Abbreviation: INF-175D-02-01</p> <p>Date Completed: 12/13/2022</p> <p>Author: Brent Gilson and Josh Kitzerow</p>	0	0	<p>Academic: LS: 11-12.1</p> <p>CTE Anchor: Communications: 2.1</p> <p>CTE Pathway: D1.1</p>

Entered by:

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