Introduction to Unreal Engine
Chapter 01

CTSA Standards

1A-AP-15	Using correct terminology, describe steps taken and choices made during the iterative process of program development. At this stage, students should be able to talk or write about the goals and expected outcomes of the programs they create and the choices that they made when creating programs. This could be done using coding journals, discussions with a teacher, class presentations, or blogs.

Objectives

- Demonstrate how to use the Unreal Engine Editor as a development environment.
- Construct Blueprint code using nodes.
- Make use of Unreal Engine to provide an engaging learning environment.

Introduction

The Unreal Engine is a tremendous tool. Most apparently, it is a tool to create computer games, however it is also used for many other fields such as architecture, film and television, simulation, and even automotive and transportation.

While the gist of this course is to teach Computer Science, it will also be necessary to delve into topics that are well integrated into Unreal Engine, such as Collision Theory, 3D space. While these topics aren't necessarily "Computer Science", they are areas that provide endless opportunities to demonstrate computer science concepts and solutions. As such, having all of this wrapped up in a game engine that is readily identifiable by students everywhere makes for a very compelling and exciting argument to learn how to program.

This course isn't about writing games, but it will teach students Computer Science concepts while learning some of the skills needed to write games. This is by design.

Course Materials

The Course Materials are distributed in PDF form. There are matching UE project files for each lesson. For example, Chapter 02, Lesson 01 has a matching project distributed in the Ch02Lesson01.zip archive. The archive format is as follows:

Content
- → LessonXX/
  - → Solutions/
  - → Maps/
- → NonLessonContent

The LessonXX will be Lesson01, Lesson02, and so on, depending on which lesson is being taught. Within that folder will be any starter blueprints needed for the lesson.

The NonLessonContent folder will contain any supporting assets required for the project.

Where appropriate, video materials will be uploaded and linked to on YouTube.

Reflection

Journaling and Reflection should be an integrated part of any instruction. Whether students maintain a daily or weekly journal and what that journal looks like is at the discretion of the instructor. A shared journal with peer review and commenting is often an excellent way to provide constructive feedback.

Rubrics

The following rubric can be utilized in all lessons. Teachers are encouraged to add additional, topic specific activities and rubrics where appropriate.

Computer Science with Blueprints and Unreal Engine

	Developing - 1	Competent - 2	Proficient - 3	Distinguished - 4
Content	**The student:** Accessed the instructional content and applied some of the instruction to their project.	**The student:** Followed the instructional content and applied most of the instruction to their project.	**The student:** Followed the instructional content and applied the instruction to their project.	**The student:** Followed the instructional content and applied all of the steps to their project. Is able to demonstrate relevance of content in other areas.
Engagement	**The student:** Required direct instruction numerous times in order to complete the unit. Made no attempt at fixing errors on their own.	**The student:** Required assistance numerous times to complete the unit. Investigated solutions on their own but did not attempt to try solutions.	**The student:** Required a minimum of assistance to successfully complete the unit. Investigated solutions and attempted to remedy problems.	**The student:** Sought own resources when challenged and required no additional assistance to complete the unit.
Objectives	**The project:** Did not meet the objectives of the lesson.	**The project:** Met some of the objectives of the lesson.	**The project:** Met the objectives of the lesson.	**The student:** Exceeded the objectives of the lesson. Demonstrated mastery by performing one or more of the challenges..
Reflection	Reflection in the journal was minimal.	Reflection in the journal was observed and mostly relevant.	Reflection in the journal was relevant and demonstrated an understanding of the unit. An annotated screenshot was included in the reflection.	Reflection in the was relevant to the unit and demonstrated several areas of learning. An annotated screenshot was included that was related to and reinforced the reflection.