



**COWLEY COLLEGE  
& Area Vocational Technical School**

**COURSE PROCEDURE FOR**

**3D GAME DEVELOPMENT  
CIS1885 3 Credit Hours**

**Student Level:**

This course is open to students on the college level in either Freshman or Sophomore year.

**Catalog Description: CIS1885 3D GAME DEVELOPMENT (3 hrs)**

An introductory course to give computer science majors an introduction to 3D game development including graphics, sound, and input.

**Prerequisites: None**

**Controlling Purpose:**

This course is designed to help the student increase their knowledge concerning the basic techniques of creating 3D computer games including design, implementation and testing. Students will study software technologies related to game development including the art and design of creating games. The basics of 3D modeling will be covered.

**Learner Outcomes:**

Upon completion of the course, the student will be able to develop simple 3D computer games and work with 3D models. The student will have an understanding of the basics of game programming including graphics, sound, and input.

**Units Outcomes and Clock Hours of Instruction for Core Curriculum:**

The following outline defines the minimum core content not including the final examination period. Instructors may add other material as time allows.

**Evaluation Key:**

- A** = All major and minor goals have been achieved and the achievement level is considerably above the minimum required for doing more advanced work in the same field
- B** = All major goals have been achieved, but the student has failed to achieve some of the less important goals. However, the student has progressed to the point where the goals of work at the next level can be easily achieved.
- C** = All major goals have been achieved, but many of the minor goals have not been achieved. In this grade range, the minimum level of proficiency represents a person who has achieved the major goals to the minimum amount of preparation necessary for taking more advanced work in the same field, but without any major handicap of inadequacy in his background.
- D** = A few of the major goals have been achieved, but the student's achievement is so limited

that he is not well prepared to work at a more advanced level in the same field.

- F** = Failing, will be computed in GPA and hours attempted.
- N** = No instruction or training in this area.

<b>UNIT 1: Introduction to 3D Game Development</b>						
Outcomes: Upon completion of the unit, the student will have an overview of 3D game development and some of the tools available.						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Describe the basics of the computer game industry.
						Identify the elements of a 3D Game
						Explain the game engine.
						Install the game engine.

<b>UNIT 2: Introduction to Scripting/Programming</b>						
Outcomes: Upon completion of the unit, the student will be able to successfully create, compile and run basic programs using fundamental building blocks of programming.						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Define the components of a script
						Write programs using functions
						Implement the time object for animation
						Use variables
						Explain and use conditionals and state

### UNIT 3: Terrain Generation

Outcomes: Upon completion of the unit, the student will be able to create a terrain for the game

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Create environments
						Create a terrain object
						Build a flythrough scene navigation
						Describe the terrain engine
						Paint a texture
						Create a terrain asset
						Apply shadows
						Create trees and fog

### UNIT 4: Navigation and Functionality

Outcomes: Upon completion of the unit, the student will be able to control navigation in a game as well as interaction with the environment

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Implement navigation in a game
						Use arrow navigation and input
						Modify the mouse look
						Use platform functionality
						Program collision walls
						Describe the purpose of object names
						Define boundaries

### UNIT 5: Cursor Control

Outcomes: Upon completion of the unit, the student will be able to control basic cursors of the operating system

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A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Control cursor visibility
						Create custom cursors
						Use the texture importer
						Implement color cues
						Explain the advantage and disadvantages of a hardware cursor
						Describe object to object communication
						Program mouseover cursor changes

**UNIT 6: Imported Assets**

Outcomes: Upon completion of the unit, the student will be bring in external assets to the game environment

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						HERE
						Implement Triggers.
						Implement GameConnection messages.
						Understand servers.
						Describe options for 3D art assets
						Import art assets
						Apply import settings for a model to change the position and scale of a model
						Use settings to control the rigging of an animation object
						Implement parenting between a parent object and child objects
						Apply settings to control animations
						Import complex hierarchies with animations
						Setup materials for assets
						Incorporate shadows to create realistic effects

**UNIT 7: Action Objects**

Outcomes: Upon completion of the unit, the student will be able to implement action objects to handle collisions and sound effects

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Implement colliders
						Create an action to trigger an animation
						Trigger complex hierarchies
						Add sound F/X
						Setup a two-state animation
						Use Unity's animation view
						Change imported animations
						Trigger another object's animation

**UNIT 8: Managing State**

Outcomes: Upon completion of the unit, the student will understand how to programmatically keep track of the state of the game including scores, inventory, and tracking of placement in the game world

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Identify the action objects
						Develop a state machine
						Describe the components of a state machine
						Separate state metadata and transition action
						Visual transitions
						Create an object lookup table
						Use the Object Lookup script
						Implement action-related messages
						Describe object metadata
						Activate the state engine

**UNIT 9: Exploring Transitions**

Outcomes: Upon completion of the unit, the student will be able to handle transitions of various objects along with the movement of the camera

A	B	C	D	F	N	Specific Competencies

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Outcomes: Upon completion of the unit, the student will be able to handle transitions of various objects along with the movement of the camera

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Process the auxiliary objects
						Handle object visibility
						Ensure player focus
						Use camera match

**UNIT 10: Physics and Special Effects**

Outcomes: Upon completion of the unit, the student will be able to incorporate physics and special effects to create a more realistic game play

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Add new assets
						Implement physics techniques
						Combine physics and keyframe animation
						Use particle systems to create various special effects
						Create laser special effect

**UNIT 11: Message Text**

Outcomes: Upon completion of the unit, the student will be able to write text to the screen

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Apply a GUI skin
						Create text in the game world
						Control text visibility
						Use the object metadata

**UNIT 12: Inventory Logic**

Outcomes: Upon completion of the unit, the student will be able to implement an inventory screen to keep track of assets

A	B	C	D	F	N	Specific Competencies

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Outcomes: Upon completion of the unit, the student will be able to implement an inventory screen to keep track of assets

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Use layers
						Create the inventory screen
						Add inventory icons
						Drop cursors in the 3D scene
						Organize the inventory objects
						Control the inventory layout and overflow
						Add and remove objects from inventory

### UNIT 13: Dialogue Trees

Outcomes: Upon completion of the unit, the student will be able to implement dialogues between users of a game

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Start a conversation with code
						Filter topics
						Add external audio clips

### UNIT 14: Mecanim and Characters

Outcomes: Upon completion of the unit, the student will be able to use the built in Mecanim for basic animation and control the character

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Add a character
						Control a character
						Implement the NPC controller
						Combine characters and dialogue
						Implement communication with the dialogue manager

## UNIT 15: Menus and Levels

Outcomes: Upon completion of the unit, the student will be able to implement menus and levels in a game

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Add game menus
						Use the MenuManager script
						Create the main menu
						Add game play buttons
						Create a settings menu
						Implement confirm dialogs
						Add audio
						Create a level save and load
						Write a traveling between levels procedure
						Publish a game

### **Projects Required:**

As assigned in class

### **Textbook:**

Please Contact Bookstore for current textbook.

### **Materials/Equipment Required:**

#### **Attendance Policy:**

Students should adhere to the attendance policy outlined by the instructor in the course syllabus.

### **Grading Policy:**

The grading policy will be outlined by the instructor in the course syllabus.

### **Maximum class size:**

Based on classroom occupancy

### **Course Time Frame:**

The U.S. Department of Education, Higher Learning Commission and the Kansas Board of Regents define credit hour and have specific regulations that the college must follow when developing, teaching and assessing the educational aspects of the college. A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work for approximately fifteen weeks for one semester hour of credit or an equivalent amount of work over a different amount of time. The number of semester hours of credit allowed for each distance education or blended hybrid courses shall be assigned by the college based on the amount of time needed to achieve the same course outcomes in a purely face-to-face format.



**Refer to the following policies:**

[402.00 Academic Code of Conduct](#)

[263.00 Student Appeal of Course Grades](#)

[403.00 Student Code of Conduct](#)

**Disability Services Program:**

Cowley College, in recognition of state and federal laws, will accommodate a student with a documented disability. If a student has a disability which may impact work in this class and which requires accommodations, contact the Disability Services Coordinator.