



**COWLEY COLLEGE  
& Area Vocational Technical School**

**COURSE PROCEDURE FOR**

**2D GAME DEVELOPMENT  
CIS1883 3 Credit Hours**

**Student Level:**

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

**Catalog Description: CIS 1883 2D GAME DEVELOPMENT (3 hrs)**

An introductory course to give computer science majors an introduction to 2D game development including graphics, sound, and input.

**Prerequisites:**

None

**Controlling Purpose:**

Students will learn the basic techniques of creating a computer game including design, implementation and testing. Students will study software technologies related to game development including the art and design of creating games.

**Learner Outcomes:**

This course covers the basic elements of developing 2D games. This course is designed to give the student an introduction to 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.

**UNIT 1: Asset Creation**

**Outcomes: Upon completion of the unit, the students will be able to successfully create and manage assets for the game environment.**

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						List common file formats
						Import assets
						Create a game object
						Create a component

**UNIT 2: 2D Vector Graphics Programming**

**Outcomes: Upon completion of the unit, the students will be able to successfully create and draw primitives, sprites, and sprite sheets in a game**

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Identify graphics fundamentals.
						Draw graphics primitives.
						Print text on the screen.
						Build a sprite
						Implement sprite packing

**UNIT 3: The Game World**

**Outcomes: Upon completion of the unit, the students will be able to successfully write a game that programmatically controls the game world environment:**

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Describe the purpose of the roadmap for a game

**UNIT 3: The Game World**

**Outcomes:** Upon completion of the unit, the students will be able to successfully write a game that programmatically controls the game world environment:

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Contrast perspective versus isometric
						Use camera controls
						Manipulate objects using tools and settings

**UNIT 4: Basics of Movement and Player Control**

**Outcomes:** Upon completion of the unit, the students will be able to successfully implement movement of sprites and player objects automatically and by player control:

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Implement player movement using automatic routines and player control
						Setup a basic follow-cam
						Use the input manager
						Implement basic error handling and debugging

**UNIT 5: Adding Animations**

**Outcomes:** Upon completion of the unit, the students will be able to successfully implement basic animations in a game:

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Describe basic rules for animation
						Create animations in a game
						Use animation states
						Work with the state machine

**UNIT 6: Setting up Player Physics and Colliders**

**Outcomes:** Upon completion of the unit, the students will be able to successfully demonstrate the ability to setup and implement player physics and colliders:

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Describe physics implementation in a game
						Explain physics 2D settings
						Implement rigidbodies, colliders, physics materials, and constraints

**UNIT 7: Creating and Applying Gameplay Systems**

**Outcomes:** Upon completion of the unit, the students will be able to successfully implement game level design and programming to control the gameplay system:

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Implement triggers
						Create checkpoints
						Use checkpoints with respawn
						Create collectibles
						Track game statistics and settings

**UNIT 8: Creating Hazards and Difficulty**

**Outcomes:** Upon completion of the unit, the students will be able to implement features to enhance a game with hazards and difficulty playing against the computer:

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Implement an enemy gameobject
						Work with damage and player death for the enemy gameobject
						Implement platforming
						Implement multiple enemy gameobjects

**UNIT 9: Creating the Menus and Interface Elements**

**Outcomes:** Upon completion of the unit, the students will be able to implement a UI design in a game along with menus:

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Describe UI design
						Plan and implement a UI design in a game
						Create a splash screen, title screen, game over screen, and game win screen
						Implement heads up elements

**UNIT 10: Applying effects to the GameObjects**

**Outcomes:** Upon completion of the unit, the students will be able to apply special effects to a game and implement audio to enhance the game:

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Explain the Shuriken Particle System
						Add particle effects to a game
						Implement audio in a game
						Add sound to a player object and collectible system

**UNIT 11: The Importance of Game Design**

**Outcomes:** Upon completion of the unit, the students will be able to unite all the game design components into one game environment as well as planning the installation / delivery of the game system:

						Specific Competencies
A	B	C	D	F	N	Demonstrate the ability to understand the importance of design in game development:
						Identify game design basics.
						Identify game development phases.
						Identify post-production of game design.
						Organize assets, scripts, and code
						Implement optimizations
						Connect the levels into one game
						Describe implementation basics

**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.