



**COWLEY COLLEGE  
& Area Vocational Technical School**

COURSE PROCEDURE FOR

**3D COMPUTER ANIMATION /  
PROGRAMMING  
CIS1882 3 Credit Hours**

**Student Level:**

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

**Catalog Description: CIS1882 3D COMPUTER ANIMATION (3hrs)**

An introductory course to give computer science, art, and computer graphics majors an introduction to 3D computer animation and how to use a programming language in conjunction with models and animations.

**Prerequisites:**

None

**Controlling Purpose:**

This course is designed to introduce students in computer science, art, or computer graphics to the concepts of 3D computer animation and animation programming.

**Learner Outcomes:**

The student will gain a comprehensive overview of 3D modeling concepts.

**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: Interface and Objects**

**Outcomes:** Upon completion of the unit, the students will be able to successfully demonstrate the ability to interact with the interface of the modeling and scripting features of the software.

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Identify work areas and window types.
						Navigate the 3D space.
						Identify objects and datablocks.
						Navigate the scripting environment.

**UNIT 2: Meshes**

**Outcomes:** Upon completion of the unit, the students will be able to successfully demonstrate the ability to use polygons, sub surfacing, extrusion modeling, and box modeling to create models. Students will learn how to programmatically create various objects.

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Use polygons and sub surfacing
						Use extrusion modeling and box modeling
						Use scripting to create and edit objects

**UNIT 3: Materials, Textures, and Particles**

**Outcomes:** Upon completion of the unit, the students will be able to successfully demonstrate the ability to implement materials, textures, UV mapping, and static particles. Students will learn how to programmatically manipulate materials.

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Identify and use material datablock.
						Use textures and UV mapping.

**UNIT 3: Materials, Textures, and Particles**

**Outcomes:** Upon completion of the unit, the students will be able to successfully demonstrate the ability to implement materials, textures, UV mapping, and static particles. Students will learn how to programmatically manipulate materials.

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Use static particles.
						Use scripting to transform materials.

**UNIT 4: Armatures and Rigging**

**Outcomes:** Upon completion of the unit, the students will be able to successfully demonstrate the ability to use the armature system and perform rigging. Students will learn how to programmatically work with drivers and constraints.

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Describe the armature system.
						Build a Simple Armature.
						Use rigging.
						Use scripting to implement drivers and constraints.

**UNIT 5: Shape Keys and Facial Rigging**

**Outcomes:** Upon completion of the unit, the students will be able to successfully demonstrate the ability to use shape keys, facial bones, and controls.

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Define shape key basics.
						Build a shape key set.
						Use facial bones and controls
						Implement improved mesh deformations using driven shape keys.

**UNIT 6: Basics of Animation**

**Outcomes:** Upon completion of the unit, the students will be able to successfully demonstrate the ability to create basic animations using keyframes and ipos. Students will learn how to programmatically create animations.

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Use keyframes and ipos.
						Implement interpolation and extend types.
						Use scripting to control ipos.

**UNIT 7: Armature Animation**

**Outcomes:** Upon completion of the unit, the students will be able to successfully demonstrate the ability to create animations based on armatures including posing, keyframing, and common animations. Students will programmatically control posing and keyframing.

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Use posing and keyframing.
						Identify and implement walk and run cycles.
						Identify and implement pose-to-pose animation.
						Use scripting to control posing and keyframing.

**UNIT 8: Facial Animation and Lip Sync**

**Outcomes:** Upon completion of the unit, the students will be able to successfully demonstrate the ability to create facial animations and perform lip syncs.

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Implement facial posing.
						Use lip sync.

**UNIT 9: Nonlinear Animation****Outcomes: Upon completion of the unit, the students will be able to successfully demonstrate the ability to create nonlinear animations.**

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Use the NLA Editor
						Define the concepts of nonlinear animation

**UNIT 10: Further Concepts in Character Animation****Outcomes: Upon completion of the unit, the students will be able to successfully demonstrate the ability to create animations using props, lattices, softbodies, and metaballs.**

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Implement Interacting with props.
						Use deformation with lattices.
						Create softbodies and metaballs.

**UNIT 11: Lighting, Rendering, and Editing****Outcomes: Upon completion of the unit, the students will be able to successfully demonstrate the ability to control lighting and rendering basics.**

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Describe lighting basics.
						Render an animation.
						Use the sequence editor.

**UNIT 12: Scripts and Game Development****Outcomes: Upon completion of the unit, the students will be able to successfully demonstrate the ability to integrate animation programming with a simple game.**

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Execute scripts in a simple game.
						Work with standard scripts.

**UNIT 12: Scripts and Game Development**

**Outcomes: Upon completion of the unit, the students will be able to successfully demonstrate the ability to integrate animation programming with a simple game.**

A	B	C	D	F	N	Specific Competencies
						<b>Demonstrate the ability to:</b>
						Extend functionality of the game with scripts.

**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.