

APTE 70 Course Outline as of Summer 2025**CATALOG INFORMATION**

Dept and Nbr: APTE 70 Title: INTER 3D ANIMAT (RVPA)

Full Title: Intermediate 3D Modeling and Animation (RVPA)

Last Reviewed: 1/22/2024

| Units | Course Hours per Week | | Nbr of Weeks | | Course Hours Total | |
|---------|-----------------------|-------------------|--------------|------|--------------------|-------|
| Maximum | 3.00 | Lecture Scheduled | 3.00 | 17.5 | Lecture Scheduled | 52.50 |
| Minimum | 3.00 | Lab Scheduled | 0 | 8 | Lab Scheduled | 0 |
| | | Contact DHR | 0 | | Contact DHR | 0 |
| | | Contact Total | 3.00 | | Contact Total | 52.50 |
| | | Non-contact DHR | 0 | | Non-contact DHR | 0 |

Total Out of Class Hours: 105.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly: APTECH 70

Catalog Description:

Students learn advanced techniques in modeling and animation using three-dimensional (3D) animation software. The topics include advanced modeling tools; texture mapping; topology and facial expressions; lighting and reflection effects; function curves; particle systems; camera effects; scene direction; sound; basic video editing; rigging and skinning; and animating using inverse kinematics.

This is a Regional Virtual Production Academy (RVPA) course that is not offered at SRJC but is available through one or more of the other five participating colleges of the RVPA collaborative program. Learn more about the RVPA at <https://cs.santarosa.edu/vp>

Prerequisites/Corequisites:**Recommended Preparation:****Limits on Enrollment:****Schedule of Classes Information:**

Description: Students learn advanced techniques in modeling and animation using three-dimensional (3D) animation software. The topics include advanced modeling tools; texture mapping; topology and facial expressions; lighting and reflection effects; function curves; particle systems; camera effects; scene direction; sound; basic video editing; rigging and skinning; and animating using inverse kinematics.

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Prerequisites/Corequisites:

Recommended:

Limits on Enrollment:

Transfer Credit: CSU;

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

| | | | |
|----------------------|----------------------|----------------------|-----------|
| AS Degree: | Area | Effective: | Inactive: |
| CSU GE: | Transfer Area | Effective: | Inactive: |
| IGETC: | Transfer Area | Effective: | Inactive: |
| CSU Transfer: | Transferable | Effective: Fall 2024 | Inactive: |
| UC Transfer: | | Effective: | Inactive: |

CID:

Certificate/Major Applicable:

Both Certificate and Major Applicable

COURSE CONTENT

Student Learning Outcomes:

At the conclusion of this course, the student should be able to:

1. Exhibit advanced skills in modeling and animating by creating highly-detailed virtual 3D characters.
2. Demonstrate proficiency in creating and animating character rigs and atmospheric effects in a virtual 3D environment.
3. Assess the incorporation of various Principles of Animation to convey ideas, emotions, and viewpoints.
4. Research processes and techniques, as well as demonstrate creative thinking, innovation, and originality when creating animation projects.
5. Demonstrate understanding of concepts, techniques, terminology, and the ability to think critically during the critique process.

Objectives:

At the conclusion of this course, the student should be able to:

1. Comprehend 3D modeling and animation's role and usage in society
2. Effectively interface with the 3D modeling and animation software
3. Analyze models and scenes

4. Create and edit 3D models and scenes
5. Assign bitmap and procedural materials to 3D objects
6. Set and adjust lighting and shadows
7. Establish and control environmental factors within 3D scenes
8. Animate movement and characteristics of objects, lights, and cameras
9. Apply 3D rendering principles and procedures

Topics and Scope:

- I. Accessing Internet
- II. Advanced Concepts of Animation
- III. Secondary Principles of Animation
 - A. Timing
 - B. Staging
 - C. Follow-through
 - D. Secondary action
 - E. Details
- IV. Camera Control and Movie Direction Techniques
- V. High- versus Low-Poly Modeling and Normal Mapping
- VI. Advanced Texturing Techniques, Reflective and Glowing Effects, and Rendering Techniques
- VII. Hair and Fabric
- VIII. Advanced Particle Systems, Ripples, Forces, and Explosions
- IX. Creating, Rigging, and Skinning Bones
- X. Animating Characters Using Inverse Kinematics
- XI. Advanced Use of Morpher Modifier
- XII. Advanced Use of Graph Editors and Function Curves
- XIII. Introduction to Video Editing Software and Adding Sound to the Animation
- XIV. Hair and Fabric Tutorial
- XV. Exploding a Teapot and Dissolving a Teapot
- XVI. Glowing Wireframe Teapot
- XVII. Smoke Tutorial, Wind, and Gravity
- XVIII. Virtual Physics and Ripples on a Surface
- XIX. Biped Tutorial
- XX. Quadruped Tutorial
- XXI. Snakes and Tentacles
- XXII. Brainstorm, Sketch, Design, and Sculpt a High-Poly Character
- XXIII. Rig and Texture the High-Poly Character
- XXIV. Creation of Advanced 3D Animation Projects
 - A. High-poly character
 - B. Background elements
 - C. Sound
 - D. Demonstrating the Principles of Animation
 - E. Utilizing bone systems
 - F. Morpher
 - G. Storytelling
 - H. Particle effects
 - I. Use of camera effects to convey emotion

Assignment:

- A. Reading Assignments

1. Assigned reading from software tutorials and class lecture notes
- B. Projects, Activities, and other Assignments
 1. In-class advanced 3D animation assignments:
 - a. Realistic cigarette smoke wafting from a cigarette in a bar room scene
 - b. Exploding and dissolving teapots
 - c. Creating bones and rigging a character
 - d. Make a character dance
 - e. Expressive face displaying a full range of emotions and speech phonemes
 2. Storyboard proposals for midterm and final projects, including drawings and text
 3. Midterm and final 3D animation projects, which are conceived and generated by the individual student, such as:
 - a. A short story or movie involving a robot or dinosaur
 - b. An action sequence with a low-poly video game character
 4. Class critiques of other students' projects
- C. Writing Assignments
 1. Storyboard and written proposal describing how the student's animation project demonstrates the principles of animation, and how particular animation techniques were used to enhance the animation and convey emotion
- D. Final exam

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Storyboards and written proposals for midterm and final projects

Writing
10 - 20%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Midterm project; Final project

Problem solving
15 - 45%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

In-class 3D animation assignments

Skill Demonstrations
25 - 45%

Exams: All forms of formal testing, other than skill performance exams.

Final exam

Exams
5 - 30%

Other: Includes any assessment tools that do not logically fit into the above categories.

Critiques

Other Category
0 - 5%

Representative Textbooks and Materials:
Instructor prepared materials