

**APTE 162 Course Outline as of Fall 2026****CATALOG INFORMATION**

Dept and Nbr: APTE 162 Title: 3D ANIM: VISUAL FX, COMP

Full Title: 3D Animation: Visual Effects and Compositing

Last Reviewed: 9/22/2025

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	1.00	6	Lab Scheduled	17.50
		Contact DHR	0		Contact DHR	0
		Contact Total	4.00		Contact Total	70.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 175.00

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 162

**Catalog Description:**

In this course, students will create digital characters and synthetic environments as used in film, broadcast, and video games. Using software such as Autodesk 3ds Max or Autodesk Mudbox, students will design and build increasingly complex three-dimensional (3D) sets, props, and characters. They will also craft control systems for effectively animating these digital components. Efficient workflow and the creation of animator-friendly rigs will be emphasized, and complementary software will be used for texturing and refining of models.

**Prerequisites/Corequisites:**

Course Completion of APTE 43

**Recommended Preparation:****Limits on Enrollment:****Schedule of Classes Information:**

Description: In this course, students will create digital characters and synthetic environments as used in film, broadcast, and video games. Using software such as Autodesk 3ds Max or Autodesk Mudbox, students will design and build increasingly complex three-dimensional (3D)

sets, props, and characters. They will also craft control systems for effectively animating these digital components. Efficient workflow and the creation of animator-friendly rigs will be emphasized, and complementary software will be used for texturing and refining of models.

(Grade Only)

Prerequisites/Corequisites: Course Completion of APTE 43

Recommended:

Limits on Enrollment:

Transfer Credit:

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

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>	Effective:	Inactive:
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<b>CSU GE:</b>	<b>Transfer Area</b>	Effective:	Inactive:
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<b>IGETC:</b>	<b>Transfer Area</b>	Effective:	Inactive:
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<b>CSU Transfer:</b>	Effective:	Inactive:
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<b>UC Transfer:</b>	Effective:	Inactive:
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**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. Effectively create dynamic simulations and particle-based VFX.
2. Match and combine live-action and computer-generated imagery.

**Objectives:**

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

1. Develop and modify a range of particle systems.
2. Use multiple dynamic simulation tools.
3. Generate and apply matchmoving and motion capture data.
4. Composite live-action and computer-generated imagery.

**Topics and Scope:**

- I. Visual Effects Overview
  - A. Special Effects versus Visual Effects
  - B. History of VFX
  - C. Computer generated imagery and compositing
- II. Particle Systems
  - A. Basic particle systems
  - B. Event-driven systems
  - C. Advanced particle flow effects
- III. Dynamic Simulations

- A. Dynamic Simulation Solvers
  - 1. Force, volume, mass, and density
  - 2. Rigid body dynamics
  - 3. Capturing transformations
- IV. Motion Capture
  - A. Introduction to motion capture systems
  - B. Application of motion capture data
- V. Compositing in 3D software
  - A. Composite maps and nodes
  - B. Combining live-action with computer-generated (CG) assets
    - 1. Perspective matching
    - 2. Lighting and environment matching
    - 3. Camera matching
- VI. Compositing
  - A. Compositing software overview
    - 1. Workspace
    - 2. Project setup
    - 3. Basic tools
    - 4. Compositions, nodes & layers
    - 5. Basic effects
  - B. Compositing render elements
  - C. Matchmoving and camera tracking
    - 1. Generating camera data
    - 2. Applying camera data
  - D. Combining pre-rendered and stock footage with CG animation - Chromakey
    - 1. Using background plates
    - 2. 3D element image sequences
    - 3. Pre-keyed action footage: pyrotechnics
  - E. Audio mixing and synchronizing
  - F. Media export formats and procedures

The above topics and scope apply to both lecture and lab in an integrated format.

### **Assignment:**

Integrated Lecture-Lab Related Assignments:

1. Video Effects (VFX) and Compositing Assignments including:
  - a. Basic particle effects (1-3)
  - b. Event-driven particle effects (2-3)
  - c. Depth compositing exercises (1-3)
  - d. Dynamic simulations (2-4)
  - e. Camera tracking exercises (1-2)
  - f. Motion capture on 3D Rig (2-3)
  - g. Live actor in computer-generated set (1-2)
2. Quizzes (2-3)
3. Final Project (1)

### **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.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments are more appropriate for this course.

Writing  
0 - 0%

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

Final Project

Problem solving  
35 - 55%

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

VFX and Compositing Assignments

Skill Demonstrations  
40 - 60%

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

Quizzes

Exams  
5 - 10%

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

None

Other Category  
0 - 0%

**Representative Textbooks and Materials:**

The VES Handbook of Visual Effects: Industry Standard VFX Practices & Procedures. Edited by Jeffrey Okun and Susan Zwerman. Routledge, Taylor and Francis. 2021.  
Physics for Animators. Bousquet, Michele. CRC Press. 2015. (classic).  
Instructor prepared materials