

**APTE 162 Course Outline as of Fall 2025****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 explore a range of tools and procedures used in the visual effects (VFX) industry, including dynamic simulations, particle systems, and the integration of computer-generated and live-action imagery.

**Prerequisites/Corequisites:**

Course Completion of APTE 43

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

Description: In this course students will explore a range of tools and procedures used in the visual effects (VFX) industry, including dynamic simulations, particle systems, and the integration of computer-generated and live-action imagery. (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:
<b>CSU GE:</b>	<b>Transfer Area</b>	Effective:	Inactive:

<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:**

Lecture-Related Assignments: Lab-Related Assignments:

1. 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