

APTECH 87 Course Outline as of Fall 2021**CATALOG INFORMATION**

Dept and Nbr: APTECH 87 Title: CAD RENDERING & MODELING

Full Title: 3D Modeling and Rendering Using CAD

Last Reviewed: 9/14/2020

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	2.00	Lecture Scheduled	2.00	17.5	Lecture Scheduled	35.00
Minimum	2.00	Lab Scheduled	0.50	4	Lab Scheduled	8.75
		Contact DHR	0		Contact DHR	0
		Contact Total	2.50		Contact Total	43.75
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 70.00

Total Student Learning Hours: 113.75

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:

Catalog Description:

Computer-generated 3D modeling and rendering using AutoCAD and related software programs. Topics include: Advanced modeling/editing techniques, material assignment and editing, architectural lighting, image captured and editing.

Prerequisites/Corequisites:

Course Completion of APTECH 57

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

Description: A comprehensive study of AutoCAD's 3-dimensional modeling and rendering capabilities. The student will construct, view and render computer generated 3-D models and produce photo-realistic image files. (Grade Only)

Prerequisites/Corequisites: Course Completion of APTECH 57

Recommended:

Limits on Enrollment:

Transfer Credit:

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:		Effective:	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. Demonstrate proficiency creating and editing 3D models within the AutoCAD software program.
2. Establish, analyze, adjust, and utilize environmental settings, architectural materials, and interior and exterior light sources within the AutoCAD software program.
3. Produce photo-realistic still images from 3D CAD files.
4. Generate printed hard copies from rendered still images.

Objectives:

Upon completion of this course, students will be able to:

1. Construct wire-frame, surface, mesh and solid 3-D models within AutoCAD.
2. Save and restore material assignments, lighting, exposure, sun and sky, and environmental settings within AutoCAD.
3. Create distant, point, spot, linear, and photometric lights.
4. Create a walk-through of a rendered model.
5. Produce accurate daylighting simulation of sun, sky, ground, and cloud cover components.
6. Utilize a library of background images.
7. Produce still images.

Topics and Scope:

- I. 3-D modeling in AutoCAD
 - A. Wire-frame
 - B. Surface
 - C. Mesh
 - D. Solids
- II. Introduction to AutoCAD's render software interface
 - A. Loading models

- B. Camera viewing
- C. Interface for materials, lighting, and environment.
- D. Raytracing and settings
- III. Material assignment
- IV. Material editing
- V. Lighting fundamentals
 - A. Point, spot, and distance lighting
 - B. Photometric lighting
- VI. Environment
 - A. Sky and clouds
 - B. Fog
 - C. Background images
- VII. Capture of still images
 - A. File types
 - B. File resolution
- VIII. Plotting of still images
- IX. Walk-through animation from a 3D CAD model

Assignment:

1. Reading, approximately 10-25 pages per week.
2. Four projects:
 - a. 3D CAD work that generates photorealistic still images (3).
 - b. 3D CAD work that generates a walk-through animation (1).
3. Quizzes (2-3); 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.

None, This is a degree applicable course but assessment tools based on writing are not included because skill demonstrations 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.

None

Problem solving
0 - 0%

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

Projects

Skill Demonstrations
60 - 75%

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

True/false, Completion, 3D CAD work

Exams
25 - 40%

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

None

Other Category
0 - 0%

Representative Textbooks and Materials:

1. AutoCAD: A Problem Solving Approach: 2013 and Beyond. Tickoo, Sham. AutoDesk
2. AutoCAD and Its Applications: 2014. Shumaker, Terence, et al. Goodheart-Willcox