

**APTECH 57 Course Outline as of Fall 2014****CATALOG INFORMATION**

Dept and Nbr: APTECH 57 Title: ADVANCED AUTOCAD

Full Title: Advanced AutoCAD

Last Reviewed: 1/25/2021

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	2.00	17.5	Lecture Scheduled	35.00
Minimum	3.00	Lab Scheduled	3.00	6	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		Contact Total	5.00		Contact Total	87.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 70.00

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:

**Catalog Description:**

Computer-aided drafting using the AutoCAD software program. Areas covered include: advanced layout, construction and editing techniques, advanced dimensioning practices, 3-D modeling and rendering, software customization, project-oriented architectural, civil and mechanical engineering applications, and an introduction to computer animation.

**Prerequisites/Corequisites:**

Course Completion of APTECH 46

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

Description: Computer-aided drafting using the AutoCAD software program. Topics include advanced layout, construction and editing techniques, advanced dimensioning practices, 3-D modeling and rendering, software customization project-oriented architectural, civil, and mechanical engineering applications, and an introduction to computer animation. (Grade Only)

Prerequisites/Corequisites: Course Completion of APTECH 46

Recommended:  
Limits on Enrollment:  
Transfer Credit: CSU;  
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:
<b>CSU Transfer:</b>	Transferable	Effective: Spring 1991	Inactive:
<b>UC Transfer:</b>		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. Set up the AutoCAD software program for efficient production of architectural, engineering, and construction CAD projects.
2. Utilize the AutoCAD software program to produce architectural/construction projects and mechanical engineering projects.

**Objectives:**

Upon completion of this course, the student will be able to:

1. Set up and utilize the AutoCAD software program within various architecture, engineering, and construction industry situations.
2. Identify and use proper construction and editing techniques necessary for effective industry related layout work.
3. Demonstrate proficiency setting up dimensioning parameters for various architecture, engineering, and construction industry situations.
4. Construct wire-frame, surface, mesh, and solid 3D models within the AutoCAD software program.
5. Produce computer renderings from 3D CAD files.
6. Create and utilize a personal AutoCAD profile that will result in more efficient use of the software.
7. Produce an architectural drafting/design project that includes:
  - a. Site plan
  - b. Floor plan
  - c. 3D model
  - d. Exterior elevations
8. Produce a mechanical engineering drafting design project that includes:
  - a. 3D parts files

- b. Assembly drawing
  - c. Detailed parts drawings
9. Create a computer animation of a mechanical assembly

## **Topics and Scope:**

- I. AutoCAD software setup for various architecture, engineering, and construction industry situations
  - A. Template file
  - B. System variables
  - C. Units
  - D. Layer conventions
  - E. Text style
  - F. Dimension style
  - G. Layouts
  - H. Single and multiple file strategies
- II. Proper construction and editing techniques necessary for effective industry related layout work
  - A. Orthographic Projections
  - B. Geometric Constructions
- III. Dimensioning parameters for various architecture, engineering, and construction industry situations
  - A. Dimension and extension lines
  - B. Symbols and arrows
  - C. Text
  - D. Fit
  - E. Primary units
  - F. Alternate units
  - G. Tolerances
- IV. Wire-frame, surface, mesh, and solid 3D models within the AutoCAD software program
  - A. Lines, splines, polylines
  - B. 3Dface
  - C. Region
  - D. Mesh Modeling
  - E. Solid primitives
  - F. Boolean operations
  - G. Extrude
  - H. Revolve
  - I. Loft
  - J. Sweep
- V. Computer renderings from 3D CAD files.
  - A. Material assignment
  - B. Lighting
  - C. Environment
  - D. Still image generation and printing
- VI. Personal AutoCAD profile
  - A. Ribbon organization
  - B. Toolbars
  - C. Tool palettes
  - D. Keystrokes
- VII. Architectural drafting/design project
  - A. Site plan

- B. Floor plan
  - C. 3D model
  - D. Exterior elevations
- VIII. Mechanical engineering drafting design project
- A. 3D parts files
  - B. Assembly drawing
  - C. Detailed parts drawings
- IX. Computer animation of a mechanical assembly
- A. Material assignment
  - B. Lighting
  - C. Camera animation
  - D. Rendering

### Assignment:

1. Reading, approximately 10 - 25 pages per week.
2. Weekly CAD exercises in lab.
3. Homework: Twelve (12) computer generated CAD drawings (1 or more drawings per assignment to illustrate mastery of topics and techniques covered in class).
4. Objective and performance-based quizzes (3-4).
5. Final exam: objective and performance based.

### 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 and 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.

CAD exercises

Problem solving  
10 - 20%

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

Performance exams, CAD drawings

Skill Demonstrations  
45 - 60%

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

Multiple choice, True/false, Matching items, Completion, Computer Generated Drawings

Exams  
20 - 35%

**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