

CATALOG INFORMATION

Dept and Nbr: APTECH 46      Title: INTRO TO CAD  
Full Title: Introduction to Computer-Aided Drafting  
Last Reviewed: 8/14/2023

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: APTECH 56

**Catalog Description:**  
In this course, students will be introduced to Computer-Aided Drafting (CAD) utilizing the software application AutoCAD. Areas covered include: program organization, program commands and tools, view navigation, drawing set-up, geometric construction/editing, orthographic projection, dimensioning and text annotations, printing/plotting, and an introduction to 3-dimensional (3D) drafting and design.

**Prerequisites/Corequisites:**  
Course Completion or Current Enrollment in APTECH 45 OR INDE 50 OR HORT 93

**Recommended Preparation:**

**Limits on Enrollment:**

**Schedule of Classes Information:**  
Description: In this course, students will be introduced to Computer-Aided Drafting (CAD) utilizing the software application AutoCAD. Areas covered include: program organization, program commands and tools, view navigation, drawing set-up, geometric construction/editing, orthographic projection, dimensioning and text annotations, printing/plotting, and an

introduction to 3-dimensional (3D) drafting and design. (Grade Only)

Prerequisites/Corequisites: Course Completion or Current Enrollment in APTECH 45 OR INDE 50 OR HORT 93

Recommended:

Limits on Enrollment:

Transfer Credit: CSU;UC.

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>	Transferable	Effective:	Fall 1988	Inactive:
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<b>UC Transfer:</b>	Transferable	Effective:	Fall 1999	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. Produce CAD projects that utilize geometric construction/editing, orthographic projection, dimensioning, and text annotations.
2. Produce prints/plots from student prepared CAD files.

### **Objectives:**

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

1. Demonstrate knowledge of AutoCAD program organization
2. Execute file management operations within the Windows and AutoCAD interface
3. Execute CAD drafting/design commands
4. Set up drawing environments with AutoCAD
5. Utilize geometric positioning tools when executing precise drafting/design work
6. Generate and edit geometric constructions, dimensions, and text annotations
7. Generate and edit multi-view and orthographic projection drawings
8. Demonstrate proficiency using AutoCAD blocks
9. Effectively control printing/plotting of AutoCAD drawing files
10. Construct a 3D CAD model

### **Topics and Scope:**

- I. Introduction to the Computer as a Drafting/Design Tool
  - A. Windows desktop and Windows File Explorer navigation
  - B. Mouse usage
  - C. Keyboard entry

- D. File management
- II. Accessing AutoCAD Commands
  - A. The Ribbon
  - B. Toolbars
  - C. Palettes
  - D. Keyboard command line input
- III. Setting up the Drawing Environment
  - A. Sheet size
  - B. Units
  - C. Model/layout tabs
  - D. Layers
  - E. Linetypes
  - F. Lineweights
  - G. Drawing limits
- IV. Geometric Construction and Positioning Tools
  - A. Object snap
  - B. Directional distance entry
  - C. Polar tracking
  - D. Dynamic input
  - E. Object tracking
  - F. Grid and snap
  - G. From and point filters
- V. Geometric Constructions
  - A. Tangent arcs
  - B. Polygons
  - C. Ellipses
  - D. Concentric arcs
  - E. Parallel and perpendicular lines
  - F. Polar and rectangular arrays
  - G. Polylines
- VI. Multi-View Drawings
  - A. Xlines for use in projection layout
  - B. Correct depiction of visible, hidden, and symmetrical features at individual views
  - C. Linear, radial, and angular dimensions
- VII. AutoCAD Blocks
  - A. Creating
  - B. Inserting
  - C. Redefining blocks
  - D. Exporting blocks
- VIII. Plotting
  - A. Sheet size
  - B. Plot scale
  - C. Lineweights
  - D. Color
  - E. Digital printing
- IX. 3D Modeling
  - A. Wireframe construction
  - B. 3D faces, surfaces, and meshes
  - C. 3D solids
  - D. Basic 3D form creation techniques: extrude, revolve, loft, and sweeps
  - E. Boolean operations with 3D solids
  - F. Stereolithographic file (STL) creation for use with 3D printers

The above Topics and Scope apply to both lecture and lab course components in an integrated format.

### Assignment:

Lecture- and Lab-Related Assignments:

1. Assignment reading (2-10 pages per CAD assignment)
2. CAD assignments (12-15)
3. Quiz(zes) (0-4)
4. 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 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.

CAD assignments

Problem solving  
65 - 80%

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

None

Skill Demonstrations  
0 - 0%

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

Quiz(zes); final exam

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:

AutoCAD 2023: A Problem-Solving Approach, Basic and Intermediate. 29th ed. Tickoo, Sham.  
CADCIM Technologies. 2022.

Instructor prepared materials and lab manual