

**STATUS:**   A  

**COMMON COURSE NUMBER:**   ETD 1320  

**COURSE TITLE:**   Basic CAD  

**CREDIT HOURS:**           3          

**CONTACT HOURS BREAKDOWN:**

**Lecture/Discussion**           16          

**Lab**                   48          

**Other**                                   

**Contact Hours/Week**           4          

**CATALOG COURSE DESCRIPTION:**

Prerequisite: None

Co requisite: None

First course in computer aided design (CAD), labwork using AutoCAD software. Topics include fundamentals of DOS, AutoCAD command structure, setting units and limits, drafting primitives, layering, use of editing tools; grid, snap, and axis commands. Assignments requiring extensive use of the CAD lab.

General Education Requirements - Associate of Arts Degree, meets Area(s):

General Education Requirements - Associate in Science Degree, meets Area(s):

**UNIT TITLES:** (OVER, PLEASE)

## **UNIT TITLES:**

1. DOS Basics
2. Menus and Commands
3. Drawing Commands (Drafting Primitives)
4. Setting up New Drawings
5. Drawing Aids
6. Object Snaps
7. Layering
8. Display Controls
9. Editing Commands
10. Text
11. Polylines and Polyline Editing

## I. Course Overview:

Upon successful completion of this course, the students should be able to effectively produce two-dimensional drawings using the AutoCAD software program. Students should also have a basic understanding of DOS structure and commands.

## II. Units:

### Unit 1. **DOS Basics**

#### General Outcome:

- 1.0 The students should be able to understand how files are stored and accessed by DOS; be able to move around in the DOS structure; and be comfortable with the DOS commands needed when using a CAD system.

#### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 1.1 Format a floppy disk and label it.
- 1.2 Use the dir command to list specific files; control scrolling of the display.
- 1.3 Make a subdirectory, change directories and remove subdirectories.
- 1.4 Copy, rename, and delete files.
- 1.5 Make copies of floppy disks.
- 1.6 Backup and restore files from and to the hard drive.

## Unit 2. Menus and Commands

### General Outcome:

- 2.0 The students should be able to move around in and access all parts of AutoCAD's menu, structure, including the keyboard, screen, tablet and pull-down menus.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 2.1 Use AutoCAD's main menu to create new drawings, edit existing drawings, use the file utility menu and exit AutoCAD to DOS.
- 2.2 Understand the different parts of the graphics screen.
- 2.3 Understand the screen menu structure.
- 2.4 Use the pull-down menus.
- 2.5 Use and understand the tablet menu.
- 2.6 Understand default, the command prompt, control C and the save, end and quit commands.

### Unit 3. Drawing Commands (Drafting Primitives)

#### General Outcome:

- 3.0 The students should be able to draw lines, arcs, circles, points, donuts, ellipses and simple text accurately and efficiently.

#### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 3.1 Use absolute, relative and polar coordinates to input exact distances and angles.
- 3.2 Use the following commands and understand these commands' various subcommands: line, arc, circle, point, donut, ellipse and dtext.
- 3.3 Use the help command to obtain information about other commands.

## Unit 4.      **Setting up New Drawings**

### General Outcome:

4.0    The students should be able to begin and setup a new drawing.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 4.1    Use the units command to pick the type of units and precision to be used.
- 4.2    Use the limits command to set up an electronic "fence" around their drawing.
- 4.3    Use AutoCAD's "setup" utility to automate the process of setting up a drawing.

## Unit 5. Drawing Aids

### General Outcome:

- 5.0 The students should be able to draw more effectively using AutoCAD's various drawing aid commands.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 5.1 Understand, use and toggle on and off the "ortho" mode of AutoCAD.
- 5.2 Use snap and its various subcommands to quickly input object regular in nature.
- 5.3 Use grid and axis as visual aids to help visualize distances.

## Unit 6. Object Snaps

### General Outcome:

- 6.0 The students should be able to lock a pick point to specific locations on existing objects.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 6.1 Understand and use all 11 object snaps: nearest, endpoint, midpoint, center, node, quadrant, intersection, insertion, perpendicular, tangent and none.
- 6.2 Use the quick modifier.
- 6.3 Load and use a "running" object snaps.
- 6.4 Adjust the size of the aperture and pick-box.

## Unit 7. Layering

### General Outcome:

- 7.0 The students should be able to use layers to logically divide drawing entities onto multiple layers.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 7.1 Create new layers, set the current layer, change layer colors and line types.
- 7.2 Understand how to turn layers on and off and how to freeze and thaw layers; understand the difference between off and freeze.
- 7.3 List existing layers.
- 7.4 Understand that all objects on one layer should be one color and one line type.
- 7.5 Use LT scale to adjust the spacing of dashed lines.

## Unit 8. Display Controls

### General Outcome:

- 8.0 The students should be able to move around in their drawings using the zoom, pan and view commands.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 8.1 Use all zoom subcommands, with emphasis on zoom window, previous, all, extents and dynamic.
- 8.2 Use the pan command.
- 8.3 Use the view command to store and recall preset displays.

## Unit 9. Editing Commands

### General Outcome:

- 9.0 The students should be able to draw much more rapidly by using AutoCAD's powerful editing commands.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 9.1 Understand and use all object selection options - pick, window, crossing, last, previous, undo, remove, add, multiply, box, auto and single.
- 9.2 Understand and use the following commands, along with their appropriate subcommands: move, erase, eliminate, m, copy, rotate, break, trim, extend, scale, mirror, stretch, offset, fillet, and chamfer
- 9.3 Understand how to use the change command to change lines, text, circles; How to move objects from one layer to another.

## Unit 10. Text

### General Outcome:

- 10.0 The students should be able to place text on their drawings in different styles and justifications.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 10.1 Know the difference between the text and Dtext commands.
- 10.2 Understand the various justifications: left, center, right, middle, fit and aligned.
- 10.3 Use the style command to change how text appears.
- 10.4 Understand the use of the Qtext command.

## Unit 11. Polylines and Polyline Editing

### General Outcome:

11.0 The students should be able to draw and edit polylines and polyarcs.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 11.1 Use the pline command, along with its subcommands to produce polylines (line and arc segments).
- 11.2 Understand the benefits of polylines.
- 11.3 Edit existing polylines using pedit and its subcommands.
- 11.4 Understand the effect of the explode command on polylines.