COURSE NUMBER: EG1430

COURSE TITLE: AutoCAD Essentials

COURSE DESCRIPTION:

Computer Aided Drafting software is a tool that enables you to produce engineering drawings more accurately and with greater efficiency. It also facilitates the ability to share files with other software programs. This course is designed in a pedagogical format by presenting the fundamental concepts at the beginning and moving toward the more advanced and specialized features of AutoCAD. It is also designed with the understanding that the student has the engineering graphics fundamentals necessary to apply the AutoCAD software. Applications and examples have an inclination towards many different technology disciplines.

PREREQUISITES: EG1110 - Engineering Graphics

CO-REQUISITES: None

CREDIT VALUE: Three (3)

COURSE HOURS PER WEEK: Two (2)

LAB HOURS PER WEEK: Two (2)

SUGGESTED TEXT:

In-house manual

LEARNING RESOURCES:

Shrock, C. (2009). *Beginning Autocad 2010 exercise workbook*. Industrial Press. ISBN-10: 0831134046; ISBN-13: 978-0831134044

MAJOR TOPICS:

1.0 Introduction to CAD
2.0 Entity Creation
3.0 Editing Existing Entities
4.0 Layers, Linetypes and Colours
5.0 Blocks
6.0 Dimensioning
7.0 Plotting
8.0 External Reference Drawings
9.0 Paper Space

LEARNING OBJECTIVES:

The expected learning outcome is that the student will be able to:

1.0 Introduction to CAD

1.1 Overview of Computer Aided Drafting Software
- 1.1.1 Explain the advantages of Computer Aided Drafting Software
- 1.1.2 List common Computer Aided Drafting Software
- 1.1.3 List interactive third party software for various engineering disciplines

1.2 Different AutoCAD type files
- 1.2.1 State the purpose of the different files associated with the different filename extensions

1.3 The Drawing Editor
- 1.3.1 Identify the different areas of the drawing editor

1.4 Dialogue boxes
- 1.4.1 Describe the function of dialogue boxes

1.5 Cartesian Coordinate system
- 1.5.1 Use absolute, relative and polar coordinates for accurate data entry

1.6 Creating a new drawing
- 1.6.1 Create a new drawing file

1.7 Opening an existing drawing
- 1.7.1 Open an existing drawing file

1.8 Saving a drawing
- 1.8.1 Save a finished drawing file to disk

1.9 Menu structure
- 1.9.1 Manipulate the various available menus

1.10 Exiting AutoCAD
- 1.10.1 Exit the program, both with and without saving the file

1.11 File management
- 1.11.1 Copy files
- 1.11.2 Rename files
- 1.11.3 Delete files

2.0 Entity Creation

2.1 Lines, polylines, arcs, circles, hatching
- 2.1.1 Create lines, polylines, arcs, circles and hatching

2.2 Units, limits, grid, snap
- 2.2.1 Set up the drawing aids in a prototype drawing, including units, limits, grid, and snap

2.3 Orthogonal and coordinate display
- 2.3.1 Use the ortho mode and coordinate display

2.4 Text command
- 2.4.1 Create and place text of given height, style and angle

2.5 Object Snap
- 2.5.1 Snap (OSNAP) to key points on existing objects for accurate point placement

2.6 Zoom
- 2.6.1 Manipulate the view magnification (ZOOM)

2.7 Inquiry commands
- 2.7.1 Use inquiry commands to query existing database

3.0 Editing Existing Entities

3.1 Move, copy, erase, trim, extend, stretch, scale, mirror and array commands
- 3.1.1 Use the move command to edit entities
- 3.1.2 Use the copy command to edit entities
- 3.1.3 Use the erase command to edit entities
- 3.1.4 Use the trim command to edit entities
- 3.1.5 Use the extend command to edit entities
- 3.1.6 Use the stretch command to edit entities
- 3.1.7 Use the scale command to edit entities
- 3.1.8 Use the mirror command to edit entities
- 3.1.9 Use the array command to edit entities

3.2 Offset, fillet, chamfer, and break commands
- 3.2.1 Use the offset command to modify entities
- 3.2.2 Use the fillet command to modify entities
- 3.2.3 Use the chamfer command to modify entities
- 3.2.4 Use the break command to modify entities

3.3 Undo command
- 3.3.1 Use the Undo command to bring back an entity

3.4 Change properties
3.4.1 Use the Change Properties dialogue box to change the properties of an object

4.0 Layers, Linetypes and Colours

4.1 Advantages of multi-layer drawings
4.1.1 Describe the advantages of multi-layer drawings

4.2 Colours per entity/layer
4.2.1 Draw with any available colour

4.3 Relationship between colour and the final plot
4.3.1 Describe the relationship between colour and the final plot

4.4 Loading default linetypes
4.4.1 List and load the default linetypes

4.5 Drawing using available linetypes
4.5.1 Draw with any available linetype

4.6 Setting-up new layers
4.6.1 Create and use new layers as appropriate for any drawing

5.0 Blocks

5.1 Purpose of blocks
5.1.1 Explain the purpose of blocks

5.2 Creating and saving blocks
5.2.1 Create and save blocks

5.3 Inserting blocks into a drawing
5.3.1 Insert blocks into a drawing

5.4 Purging existing blocks
5.4.1 Purge existing blocks

6.0 Dimensioning

6.1 Dimension Styles
6.1.1 Explain the purpose for different dimension styles
6.1.2 Create different dimension styles
6.1.3 Use different dimension styles

6.2 Editing and updating existing dimensions

6.2.1 Edit and update existing dimensions

6.3 Character codes to display symbols with dimension text
6.3.1 Use the proper character codes to display symbols with dimension text

7.0 Plotting

7.1 Plot scales
7.1.1 Calculate plotting scales based on paper size and object extents

7.2 Plotting both fitted and scaled drawings
7.2.1 Plot both fitted and scaled drawings

7.3 Plotting parameters for any desired output
7.3.1 Adjust plotting parameters as appropriate for any desired output

7.4 Plot style tables
7.4.1 Create plot style tables
7.4.2 Modify plot style tables

8.0 External Reference Drawings

8.1 Xref manager
8.1.1 Use the Xref manager to display the Xrefs and associated data for a drawing in tree view or list view
8.1.2 Attach Xref drawings
8.1.3 Detach Xref drawings
8.1.4 Bind Xref drawings

8.2 Plotting multiple scales using Xref
8.2.1 Plot multiple scales using Xref

8.3 Differentiating the contents of different Viewports
8.3.1 Differentiate the contents of different Viewports

9.0 Paper Space

9.1 Viewports
9.1.1 Create viewports in paper space
9.1.2 Use viewports in paper space

9.2 Scaling objects in paper space viewports
9.2.1 Scale objects in paper space viewports

9.3 Editing, positioning and plotting paper space layouts
9.3.1 Edit paper space layouts

9.3.2 Position paper space layouts
9.3.3 Plot paper space layouts

EVALUATION:

Final course evaluation to consist of project(s) valued at 50% and quizzes valued at 50%.

DATE DEVELOPED:	Nov. 23, 2004	**DATE REVIEWED:**	February 2014
REVISION NUMBER:	3	**DATE REVISED:**	April 2013

Note to instructor: Check PIRS to ensure this outline is the most current version.