Miami Dade College

Course Description

ETD1340 | Computer Aided Drawing & Design | 3.00 credits

This course is recommended for all engineering students as an introduction to the basic concepts of drafting and designing using a computer. Students will learn industry standard drafting and design practices using AutoCAD in a laboratory environment. Pre/Corequisite: MAC1105.

Course Competencies

Competency 1: The student will describe key terms and concepts associated with drafting and the drafting profession by:

1. Identifying industries and careers that use drafting as an important aspect in their work.
2. Identifying software drafting tools (e.g. AutoCAD, Micro station, SolidWorks, and Google SketchUp).
3. Describing the history and development of AutoCAD in the drafting profession

Competency 2: The student will identify elements of the AutoCAD software interface by:

1. Starting the AutoCAD program from the start menu
2. Using existing AutoCAD templates to create drawing documents
3. Identifying file extensions (such as .dwg,.dxf, .dwt, and .bak) and file locations
4. Creating, formatting, editing and saving an Auto CAD drawing
5. Identifying and using the different command methods including
   a.) Command line. b) Ribbon. c) Dynamic input. d) Menu browser
6. Identifying and modifying the aspects of the drawing environment including units, drawing limits, snapping variations, coordinates, and grids
7. Manipulating the drawing area by using zoom, pan, the steering wheel tool, changing the drawing order and using view ports

Competency 3: The student will demonstrate an understanding of the skills necessary to create basic 2D AutoCAD drawings by:

1. Drawing lines, curves, circles, ellipses, rectangles, polygons, and donuts
2. Modifying a drawing using the Erase tool
3. Identifying and using the various types of Object Snaps and Autotracking.
4. Using the offset tool, drawing points, construction lines and rays
5. Creating multi view drawings of an object (i.e., the "Glass Box Theory": top, bottom, sides, front, back) with hidden lines and centerlines
6. Creating partial and full auxiliary views of an object

Competency 4: The student will demonstrate the ability to modify an AutoCAD drawing by:

1. Creating and managing multiple layers that define line color, line width, line type etc.
2. Identifying and using object editing tools (such as fillet, chamfer, break, join, trim, extend, lengthen, and scale)
3. Arranging and patterning objects with move, copy, mirror, rotate, align, and array
4. Obtaining and editing object information through quick properties
5. Editing object properties
6. Drawing polylines, revision clouds, and splines, and editing and exploding polylines

Competency 5: The student will demonstrate an understanding of working with text and conveying non-pictorial information in AutoCAD by:

1. Differentiating between oblique, axonometric, and isometric drawings
2. Creating isometric drawings, including isometric ellipses and arcs
3. Creating section views (e.g., full, offset, half, aligned, revolved, removed, and broken out)
4. Applying the hatch tool to depict material surfaces and solids

Competency 6: The student will demonstrate an understanding of working with text and conveying non-pictorial information in AutoCAD by:

1. Identifying different industry standards for dimensioning including architectural, mechanical, civil and electrical dimensions and notations
2. Identifying and using continuous and datum dimensioning
3. Adding appropriate and non-redundant dimensions to a drawing
4. Editing dimensions and manually overriding text
5. Adding dimension for repetitive features, circles, arcs, etc. by utilizing the library of symbols
6. Dimensioning isometric drawings in the individual planes
7. Utilizing single and multiline text in a drawing
8. Inserting tables and fields into a drawing

Competency 7: The student will demonstrate the ability to work with the AutoCAD library by:

1. Defining the purpose of a block
2. Drawing a personalized title block and converting the drawing into a block
3. Locating and using the library of symbols and blocks to insert into a drawing
4. Creating Blocks and Wblocks and saving them into the library to use in future drawings
5. Locating and using templates
6. Utilizing the external reference tools

Competency 8: The student will demonstrate the ability to output drawings in AutoCAD by:

1. Identifying the difference between model and paper space
2. Creating multiple layouts for a drawing
3. Identifying and using floating viewports
4. Choosing the correct paper size, orientation, and other page setup options
5. Plotting drawings to scale
6. Outputting to different media (e.g., .pdf files, printers, plotters)

Learning Outcomes:

- Use computer and emerging technologies effectively