

Course Objectives/Course Outline
Spokane Community College

Course Title: Introduction to Computer Aided Drafting
Prefix and Course Number: CAD 109

Course Learning Outcomes:

By the end of this course, a student should be able to:

- Navigate around the basic AutoCAD drawing environment
- Create templates
- Become proficient at basic drawing and editing commands
- Become proficient at creating text, hatching, gradients, and dimensioning
- Learn basic drafting skills in mechanical, architectural and civil drawings
- Print and plot CAD drawings to various scales and printers and plotters
- Print and plot CAD files in a Layout format
- Demonstrate the proper operation of micro-based CAD equipment
- Apply terminology to CAD hardware operation, software, and techniques
- Apply industry standard concepts and methods of printing and plotting drawings
- Produce 2D CAD drawings that meet mechanical, architectural, and civil engineering standards

Course Outline:

- I. CAD Software Environment
 - A. Software functions and set-up
 1. startup options
 2. CAD Software environment (screens, windows, menus, short-cuts)
 3. File system, creating new drawings (wizards, templates, from scratch, file naming and extensions, file locations, etc.)
 4. File editing (open edit, save, save-as)
 5. Command methods (keyboard, pull-down menus, toolbars, etc.)
 6. Drawing environment (setting units, limits, grids, snaps, coordinates, etc,)
 7. Manipulating the drawing area (zoom, pan visibility of grids, etc.)
 - B. Drafting functions
 1. Creating geometry (Lines, Rectangles, Circles, Arcs)
 2. Sketching and drawing to scale (enter points by clicking, coordinates, or snap setting)
 3. First level editing (erase, undo, oops)

4. Selecting element for editing (pick, window, crossing, previous, etc.)
 5. Engineering lettering (basic text command)
 6. Drawing reproduction (basic printing functions)
- II. 2. CAD Coordinates, Drafting Assistance
 - A. Basic methods for creating entities in a CAD drawing environment, using basic coordinate entry and automated entry helps
 - B. Setting and using Grid, Snap, Ortho
 - C. Absolute Coordinate entry, Relative coordinates, Polar Coordinate
 - D. English/metric units
 - E. Selecting object, modes, similar objects, grips
- III. 3. Drafting Basics
 - A. Basic skills of drafting using template, environment settings, Coordinates, Drafting Assistance (snap, grids, ortho, etc.), and Viewing/Inquiry commands (zoom, pan properties, etc.).
 - B. Create, save, and apply a template file with a title block, border, snap, grid, unit and layer settings
 - C. Create and use multiple layer, colors, line-types, line widths
 - D. Find distances, calculate area, locate points
 - E. Set and use text styled, fonts, sizes in single and multiple lines
 - F. Set and use hatching and gradients
 - G. Modifying a drawing
 1. Basic skills for modifying drawing geometry (copy, move rotate, offset extend, trim stretch, scale, etc.)
 2. Scale objects to desired engineering scale factors and adjust text scales to match, both in Model Space and Paper Space
 3. Properties of objects, Style setting for lines, text, dimensions
- IV. Mechanical Drawings
 - A. Basic drafting skills in mechanical drafting format
 - B. Set and use mechanical settings for paper size, title block/border, units text font and size, common layers/colors/line-types, scale settings
 - C. Create full scale Model Space parts with scaled Model Space border and title block, adjusting text height, line-type scale, snaps and grids as required for proper industry scale factors
- V. Architectural Drawings
 - A. Basic drafting skills in architectural drafting format
 - B. Set and use architectural setting for paper size, title block/border, units, text font and size, common layers/colors/line-types, scale settings
 - C. Create full scale Model Space plans and elevations with Paper Space border and title industry scale factors
 - D. Set and lock Paper Space scale factor per viewport
 - E. Edit and add Layout tabs
- VI. Civil and Structural Drawings
 - A. Basic drafting skills in civil drafting format
 - B. Set and use civil and structural settings for paper size, title block/border, units text font and size, common layers/colors/line-types, scale settings

- C. Create full scale Model Space layouts and details with scaled Model Space or Paper Space border and title block, adjusting text height line-type scale, snaps and grids as required for proper industry scale factors or inches to feet
- D. Insert symbols and blocks
- VII. Metric Drawings
 - A. Basic drafting skills in metric drafting format
 - B. Set and use metric settings for paper size, title block/border, units text font and size, common layers/colors/line-types scale, snaps and grids as required for proper industry scale factors
 - C. Metric paper sizes – converting to inch-based printer settings
 - D. Measurement setting to metric/inch
- VIII. Mechanical Dims
 - A. Basic dimensioning skills in mechanical drafting format
 - B. Dimension style, scale, modify, units, ANSI Standards for text size, arrows, spacing, etc.
 - C. Decimals and fractions
 - D. Adding prefix, suffix, text overrides
- IX. Architectural Dims
 - A. Basic dimension skills in architectural drafting format
 - B. Dimension style, scale modify, units, ANSI and AIA Standards for text size, arrows, spacing, etc.
 - C. Linear, aligned, radius, diameter, angle, leaders, etc.
 - D. Feet and fractional inches, aligned, above the lines
- X. 10. Civil Dims
 - A. Basic dimension skills in civil drafting format
 - B. Dimension style, scale modify, units, ANSI Standards for text size, arrows spacing, etc.
 - C. Linear, aligned, radius, diameter, angle leaders, etc.
 - D. Decimals, fractions, feet and inches, decimal feet
- XI. 11. Metric Dims
 - A. Basic dimension skills in metric drafting format
 - B. Dimension style, scale modify, units, ISO Standards for text size, arrows spacing, etc.
 - C. Linear, aligned, radius, diameter, angle leaders, etc.
 - D. Decimals, symbol format dimensions (international)
- XII. 12. Printing and Plotting
 - A. Basic skills in setting up, scaling and then plotting CAD drawings to various scales and printers/plotters
- XIII. 13. Layout Plotting
 - A. Intermediate skills in setting up, scaling, and then printing or plotting CAD files in Layout format