

Des Moines Area Community College

Course Information – EFFECTIVE Aug. 2006

Acronym/Number CAD 151 Historical Ref CADT 410

Title CAD Graphics I

Credit breakout 6 4 4 0 0
(credit lecture lab practicum work experience)

PREREQUISITE(S): Introduction to computer literacy (CSC 110) or equivalent.

COURSE DESCRIPTION:

Drawing formats, geometric construction and lettering will be taught on computer-aided drafting (CAD) software. Drafting standards will be covered. CAD operations and commands will be addressed. Sketching and fundamentals of orthographic projection are stressed. Prints will be prepared. Prints will be prepared.

COURSE COMPETENCIES:

During this course, the student will be expected to:

1. Discuss drawing types.
 - 1.1 Discuss industry drawing standards.
 - 1.1.1 Discuss ANSI standards.
 - 1.1.2 Discuss ISO standards.
 - 1.1.3 Discuss miscellaneous standards (ASME, etc.)
 - 1.2 Discuss manual drafting.
 - 1.3 Discuss computer-aided drafting.
 - 1.4 Examine engineering, drafting occupations.
 - 1.4.1 Discuss mechanical engineering.
 - 1.4.2 Discuss architectural engineering.
 - 1.4.3 Discuss civil engineering.
 - 1.4.4 Discuss electrical engineering.
 - 1.4.5 Discuss other miscellaneous fields of study.
 - 1.5 Examine related applications.
2. Identify basic drafting tools and materials.
 - 2.1 Identify manual drawing equipment.
 - 2.1.1 Identify drafting instruments.
 - 2.1.2 Identify drafting equipment.
 - 2.1.3 Identify drawing media.
 - 2.1.4 Identify reproduction equipment.
 - 2.2 Identify computer-aided drafting equipment.
 - 2.2.1 Discuss computer hardware.
 - 2.2.2.1 Identify the drawing editor.
 - 2.2.2.2 Examine command entry.

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- 2.2.2.3 Examine working with CAD files.
- 3. Analyze measurement and scaling systems.
 - 3.1 Discuss measurement.
 - 3.1.1 Examine measuring units.
 - 3.2 Examine measuring scales.
 - 3.2.1 Examine mechanical engineers scale.
 - 3.2.2 Examine civil engineers scale.
 - 3.2.3 Examine architectural engineers scale.
 - 3.2.4 Examine metric scales.
 - 3.3 Discuss drawing scale.
 - 3.3.1 Define drawing scale.
 - 3.3.2 Discuss industry standard drawing scales.
 - 3.3.3 Identify industry standard sheet sizes.
 - 3.3.3.1 Discuss drawing title blocks.
- 4. Demonstrate sketching techniques.
 - 4.1 Discuss sketching principles.
 - 4.2 Identify lead grades for sketching.
 - 4.3 Know linetypes used in sketching.
 - 4.4 Sketch straight lines.
 - 4.5 Sketch curves and circles.
 - 4.6 Demonstrate proportion in a sketch.
 - 4.7 Sketch parts using orthographic projection.
 - 4.8 Sketch parts using isometric projection.
- 5. Perform basic lettering.
 - 5.1 Identify proper text height for drawing size.
 - 5.2 Discuss font types.
 - 5.2.1 Discuss CAD fonts.
 - 5.2.2 Discuss axonometric text alignment.
 - 5.2.3 Discuss drawing symbols.
 - 5.2.4 Insert text.
 - 5.2.5 Edit text.
 - 5.3 Write the alphabet and numbers using Gothic letters.
 - 5.3.1 Using .125 tall letters.
 - 5.3.2 Using .156 tall letters.
 - 5.3.3 Using .187 tall letters.
- 6. Construct basic geometric entities.
 - 6.1 Define the "Alphabet of lines".
 - 6.1.1 Discuss CAD line types
 - 6.1.1.1 Discuss coordinate entry methods.
 - 6.1.1.2 Examine selection sets.
 - 6.1.1.3 Discuss drawing setup.
 - 6.1.1.4 Examine object snap.
 - 6.1.1.5 Examine viewing commands.
 - 6.12 Examine hidden line rules.
 - 6.13 Examine center line rules.

- 6.14 Examine CAD layers.
 - 6.1.4.1 Discuss layering schemes.
- 6.2 Create geometric shapes.
 - 6.2.1 Define a point.
 - 6.2.2 Define a line.
 - 6.2.2.1 Create line(s).
 - 6.2.3 Define a triangle.
 - 6.2.3.1 Create a triangle.
 - 6.2.4 Define a polygon.
 - 6.2.4.1 Draw inscribed.
 - 6.2.4.2 Draw circumscribed.
- 6.3 Modify geometric shapes.
 - 6.3.1 Examine manual modifying techniques.
 - 6.3.2 Examine basic CAD modifying commands.
 - 6.3.3 Examine basic CAD construction commands.
 - 6.3.4 Modify geometry.
- 7. Construct advanced geometric shapes.
 - 7.1 Examine advanced drawing commands.
 - 7.1.1 Examine advanced drawing setup.
 - 7.1.2 Examine advanced construction commands.
 - 7.2 Define an ellipse.
 - 7.2.1 Create ellipse(s).
 - 7.3 Define a parabola.
 - 7.3.1 Create a parabola.
 - 7.4 Define a helix.
 - 7.4.1 Create a helix.
 - 7.5 Examine advanced modification commands.
 - 7.5.1 Examine entity grip editing.
 - 7.5.2 Examine advanced selection sets.
 - 7.5.3 Discuss drawing data inquiry commands.
 - 7.6 Discuss grouping elements (blocks).
 - 7.6.1 Create block(s).
 - 7.6.2 Discuss block attributes.
 - 7.6.3 Insert block(s).
 - 7.6.4 Edit blocks/attributes.
- 8. Construct basic geometric intersections.
 - 8.1 Define geometric constructions.
 - 8.1.1 Examine line constructions.
 - 8.1.2 Examine circular constructions.
 - 8.2 Bisect a line.
 - 8.3 Bisect an arc.
 - 8.4 Divide a line into 3 (or more) parts.
 - 8.5 Locate the center of a circle.
 - 8.6 Draw a circle tangent to a line.
 - 8.7 Draw a circle tangent to a circle.

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- 8.8 Draw a circle tangent to an arc.
- 8.9 Draw an arc tangent to a line.
- 8.10 Draw an arc tangent to two lines.
- 8.11 Draw an arc tangent to two circles.
 - 8.11.1 Draw the inside arc.
 - 8.11.2 Draw the outside arc.
- 8.12 Draw an arc tangent to an arc and a line.
- 8.13 Draw an ogee curve.

- 9. Identify required views for a drawing.
 - 9.1 Identify orthographic projections.
 - 9.1.1 Examine circular projection.
 - 9.2 Discuss first angle projection.
 - 9.3 Discuss third angle projection.
 - 9.4 Identify the six standard views of a part.
 - 9.5 Prepare a two dimensional drawing.

- 10. Identify part surfaces.
 - 10.1 Define normal surfaces.
 - 10.1.1 Draw normal surfaces.
 - 10.2 Define inclined surfaces.
 - 10.2.1 Draw inclined surfaces.
 - 10.3 Define oblique surfaces.
 - 10.3.1 Draw oblique surfaces.

- 11. Analyze sectional views.
 - 11.1 Define section views.
 - 11.1.1 Define half section views.
 - 11.1.2 Define full section views.
 - 11.1.3 Define partial view sections.
 - 11.1.4 Discuss broken-out sections.
 - 11.1.5 Discuss removed sections.
 - 11.1.6 Discuss revolved sections.
 - 11.2 Discuss the usage of section views.
 - 11.3 Identify line usage in sections.
 - 11.3.1 Identify section lines.
 - 11.3.1.1 Examine hatching.
 - 11.3.1.2 Discuss hatch patterns.
 - 11.3.2 Identify section cross-hatching lines.
 - 11.3.2.1 Discuss ribs in sections.
 - 11.3.2.2 Discuss spokes in sections.
 - 11.3.2.3 Discuss sectioning assemblies.

- 12. Analyze basic dimensioning practices.
 - 12.1 Identify dimensioning standards.
 - 12.1.1 Discuss American National Standards Institute (ANSI).
 - 12.1.2 Discuss International Standards Organization (ISO).
 - 12.1.3 Discuss computer-aided drafting dimensioning.

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- 12.1.3.1 Examine CAD dimension settings.
- 12.2 Examine dimensioning units.
 - 12.2.1 Discuss dimension units versus CAD system units.
- 12.3 Recognize horizontal dimensions.
 - 12.3.1 Create horizontal dimensions.
- 12.4 Recognize vertical dimensions.
 - 12.4.1 Create vertical dimensions.
- 12.5 Recognize aligned dimensions.
 - 12.5.1 Create aligned dimensions.
- 12.6 Discuss radial dimensions.
 - 12.6.1 Identify radius dimensions.
 - 12.6.2 Identify circular dimensions.
 - 12.6.3 Discuss CAD variables.
 - 12.6.4 Create radical dimensions.
- 12.7 Discuss dimension placement.
 - 12.7.1 Examine extension lines.
 - 12.7.2 Examine arrowheads.
 - 12.7.3 Examine leaders.
 - 12.7.4 Examine text height/placement.
 - 12.7.5 Discuss dimension sketching.
 - 12.7.6 Discuss dimension spacing.
 - 12.7.7 Examine dimensioning do's and dont's.
 - 12.7.8 Discuss dimensioning sections.
 - 12.7.9 Discuss auxiliary view dimensions.
 - 12.7.10 Examine using layers for dimensions.
 - 12.7.11 Discuss CAD dimension variables.
- 13. Reproduce drawings.
 - 13.1 Discuss printing.
 - 13.2 Discuss plotting.
 - 13.3 Identify printing media.
 - 13.3.1 Identify "blue line print" paper.
 - 13.3.2 Identify "white print" paper.
 - 13.3.3 Identify sepia print paper.
 - 13.3.4 Discuss other types of print media.
 - 13.4 Develop plots.
 - 13.5 Develop white prints.

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COMPETENCIES REVIEWED AND APPROVED BY:

DATE: _____

FACULTY:

- 1.
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- 5.
- 6.

Effective date: August, 2004

by: JM Leetch

Campus: A B C U N W OC

extension: 6377

Revision(s): 9/97