

Des Moines Area Community College

Course Information – EFFECTIVE Aug. 2006

Acronym/Number CAD 152 Historical Ref CADT 411

Title CAD Graphics II

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

PREREQUISITE(S): CAD 151, MAT 772

COURSE DESCRIPTION:

Advanced geometric description applicable to all fields of drafting will be emphasized. Auxiliary views will be created. Descriptive geometry principles will be examined. Intermediate and advanced dimensioning techniques will be covered including dimensional tolerance analysis. CAD applications will be taught.

COURSE COMPETENCIES:

During this course, the student will be expected to:

1. Determine auxiliary views.
 - 1.1 Relate positions for views.
 - 1.1.1 Examine two dimensional drawing layouts.
 - 1.1.1.1 Identify view fold lines.
 - 1.2 Determine necessary views.
 - 1.2.1 Plot a curve in an auxiliary view.
 - 1.3 Project 3rd view.
 - 1.4 Identify alternate views.
 - 1.4.1 Discuss primary views.
 - 1.4.2 Discuss secondary views.
 - 1.5 Discuss partial views.
 - 1.6 Examine constructing an auxiliary view use CAD commands.
 - 1.6.1 Examine using tiled viewports.
 - 1.6.2 Examine using paper space viewports.
 - 1.7 Analyze auxiliary views.
 - 1.7.1 Create drawing with auxiliary views.
2. Examine descriptive geometry theorems.
 - 2.1 Discuss descriptive geometry definitions.
 - 2.1.1 Discuss descriptive problem layout.
 - 2.1.1.1 Identify problem coordinates.
 - 2.1.1.2 Discuss map coordinates.
 - 2.1.1.3 Discuss CAD considerations.
 - 2.1.2 Examine three dimensional layouts.
 - 2.1.2.1 Review relative coordinates.
 - 2.1.2.2 Review absolute coordinates.

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- 2.1.2.3 Discuss three dimensional CAD models.
 - 2.1.2.4 Discuss standard measuring units.
 - 2.1.2.4.1 Examine surveying units.
 - 2.1.2.5 Examine user coordinate systems.
 - 2.1.3 Define a point.
 - 2.1.4 Define a line.
 - 2.1.5 Define a plane.
 - 2.2 Examine fundamental views.
 - 2.2.1 Discuss line theorems.
 - 2.2.2 Discuss plane theorems.
 - 2.3 Examine skew lines.
- 3. Determine intersections of entities.
 - 3.1 Examine intersecting lines.
 - 3.2 Examine surface pierce points.
 - 3.3 Examine plane intersections.
 - 3.3.1 Examine CAD surface modeling.
 - 3.3.1.1 Create meshed surfaces.
 - 3.3.1.2 Create region surfaces.
 - 3.3.1.3 Examine thickness and elevation.
 - 3.3.1.4 Examine editing meshes.
 - 3.4 Examine perpendicular relationships.
 - 3.5 Examine dihedral angles.
 - 3.6 Examine 3D CAD models.
 - 3.6.1 Analyze modeling types.
 - 3.6.1.1 Examine wireframe models.
 - 3.6.1.2 Examine solid models.
 - 3.6.2 Discuss 3D coordinates.
 - 3.6.2.1 Examine 3D CAD coordinate utility tools/programs.
 - 3.6.3 Create 3D models.
 - 3.6.3.1 Examine 3D modeling construction techniques.
 - 3.6.3.1.1 Examine 3D wireframe construction.
 - 3.6.3.1.1.1 Create a wireframe model.
 - 3.6.3.1.2 Discuss ACIS standards.
 - 3.6.3.1.3 Discuss solid modeling software.
 - 3.6.3.1.4 Create a 3D model.
 - 3.6.3.2 Examine 3D editing/modification commands.
 - 3.6.3.2.1 Modify a 3D model.
 - 3.6.3.3 Examine 3D model viewing.
 - 3.6.3.4 Discuss Boolean operations.
 - 3.6.3.5 Examine misc. 3D commands.
 - 3.6.4 Examine using 3D models for 2D developments/intersections.
 - 3.6.4.1 Create drawing views from a 3D model.
- 4. Discuss bearing, slope and grade.
 - 4.1 Discuss map view.
 - 4.1.1 Analyze bearing coordinates.

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- 4.2 Discuss elevation views.
 - 4.2.1 Analyze true slop angles.
 - 4.2.2 Analyze grade/pitch.

- 5. Determine pattern and developments.
 - 5.1 Discuss development theorems.
 - 5.2 Discuss primitive elements.
 - 5.3 Develop basic entities in flat patterns.
 - 5.4 Develop intersections of two (or more) prisms.
 - 5.4.1 Create wireframe model.
 - 5.4.2 Create solid model.
 - 5.4.3 Create flat pattern layout.
 - 5.4.3.1 Develop a sphere.

- 6. Analyze advanced dimensioning practices.
 - 6.1 Review dimensioning standards.
 - 6.1.1 Review American National Standards Institute (ANSI).
 - 6.1.2 Review International Standards Organization (ISO).
 - 6.1.3 Review computer-aided drafting dimensioning.
 - 6.1.3.1 Examine CAD dimension settings.
 - 6.1.3.2 Discuss CAD variables for model/paper space.
 - 6.2 Discuss dimension placement for 3D entities.
 - 6.2.1 Examine model space.
 - 6.2.2 Examine paper space.
 - 6.2.3 Examine using layers for dimensions in model/paper space.

- 7. Examine advanced dimension styles.
 - 7.1 Discuss baseline dimensioning.
 - 7.1.1 Identify dimension start point (datum).
 - 7.1.2 Create baseline dimensions.
 - 7.2 Discuss chain dimensioning.
 - 7.2.1 Create chain dimensions.
 - 7.3 Discuss coordinate dimensioning.
 - 7.3.1 Discuss tabular dimensioning.
 - 7.3.2 Discuss coordinate dimensioning.
 - 7.3.3 Create coordinate dimensions.
 - 7.4 Analyze contour dimensioning.
 - 7.4.1 Discuss polar dimensions.
 - 7.5 Analyze geometric breakdown.
 - 7.6 Discuss double dimensioning.
 - 7.6.1 Describe problems incurred by double dimensioning.
 - 7.6.2 Examine use reference dimensions.
 - 7.7 Discuss dual dimensioning.

- 8. Discuss drawing notation.
 - 8.1 Discuss notes.
 - 8.1.1 Identify general notes.
 - 8.1.2 Identify local notes.

- 8.2 Create notes using a leader.

- 9. Analyze dimensional tolerances.
 - 9.1 Discuss dimensional tolerance concept.
 - 9.1.1 Identify types of mechanical fits.
 - 9.2 Discuss the American National Standards of limits and fits.
 - 9.2.1 Identify basic hole tolerancing system.
 - 9.2.2 Identify basic shaft tolerancing system.
 - 9.3 Discuss the International System of limits and fits.
 - 9.3.1 Discuss International grading system.
 - 9.4 Calculate mechanical fit between mating parts.
 - 9.4.1 Identify clearance fits.
 - 9.4.2 Identify interference fits.
 - 9.5 Calculate specifications of tolerances.
 - 9.6 Calculate accumulation of tolerances.
 - 9.7 Compare tolerances versus machining processes.
 - 9.8 Analyze obscured tolerance stackups.
 - 9.9 Discuss tolerances in various fields of draft.
 - 9.10 Create tolerance dimensions.
 - 9.10.1 Identify types of tolerance dimensions.

- 10. Identify assembly fits.
 - 10.1 Compare dimensions for mated parts.
 - 10.2 Discuss impact of different dimensioning methods.
 - 10.3 Discuss clearances for parts.

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COMPETENCIES REVIEWED AND APPROVED BY:

DATE: _____

FACULTY:

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Effective date: 9/1/97

by: JML

Campus: A B C U N W OC

extension: 6377

Revision(s): 9/97;