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**Course Outline for DSNT 62B  
COMPUTER AIDED DESIGN (CAD)**

**Effective: Fall 2002**

**I. CATALOG DESCRIPTION:**

DSNT 62B — COMPUTER AIDED DESIGN (CAD) — 3.00 units

Continuation of the knowledge and skills learned in Design Technology 62A, focusing on the design processes to complete and present drawings and accompanying documentation effectively using CAD; dimensioning, tolerancing, and crosshatching to facilitate creation of multiview layouts, managing symbol libraries to streamline pictorial assemblies, and plotting/ presentation techniques to captivate.

1.50 Units Lecture 1.50 Units Lab

**Prerequisite**

DSNT 62A - Computer Aided Drafting (CAD)  
with a minimum grade of C

**Grading Methods:**

Letter Grade

**Discipline:**

	<b>MIN</b>
<b>Lecture Hours:</b>	27.00
<b>Lab Hours:</b>	81.00
<b>Total Hours:</b>	108.00

**II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 2**

**III. PREREQUISITE AND/OR ADVISORY SKILLS:**

**Before entering the course a student should be able to:**

**A. DSNT62A**

1. identify CAD hardware and use it effectively to input drawing information;
2. use Windows Explorer to format disks and perform disk file manipulations such as copying, deleting, and finding files and folders;
3. develop preliminary planning strategies and sketches to optimize CAD efficiency;
4. set up drawing formats, use drawing aids, and apply display options productively;
5. construct accurate geometric shapes using absolute, relative and polar entry methods;
6. use object snap options effectively to create additional geometry on-the-fly;
7. determine command sequence required to select text style and placement;
8. select appropriate basic and advanced editing commands to modify existing entities;
9. construct and utilize layers, colors, and line types;
10. create and manage layouts, compatible with typical printer/plotter output devices;
11. utilize on-screen menu systems effectively;
12. create multiple patterns of drawing components;
13. obtain information about entities on the drawing;
14. construct multiview layouts with auxiliary views.

**IV. MEASURABLE OBJECTIVES:**

**Upon completion of this course, the student should be able to:**

- A. manage and search for files and folders using Window Explorer;
- B. apply fundamentals of mechanical design using the CAD workstation as a tool;
- C. properly dimension drawings and manipulate dimension variables;
- D. create and use dimension styles with appropriate overrides as required;
- E. make changes to existing dimensions in accordance with drawing revisions;
- F. gain additional control over creating and maintaining drawing layers;
- G. add tolerancing and geometric dimensioning and tolerancing to drawings;
- H. generate section views and graphic patterns;
- I. construct blocks with attributes and insert them into a drawing;
- J. extract attribute values to create a bill of materials;
- K. use external references efficiently to create multiview layouts;
- L. draw isometric drawings with dimensioning;

- M. be familiar with 3-D drawing techniques and procedures;
- N. utilize typical printer and plotter output devices;
- O. use external commands, create scripts and slide shows;
- P. demonstrate job entry level skills.

#### V. CONTENT:

- A. Fundamentals of computer-aided drafting principles reviewed
- B. Windows NT Operating System and using Windows Explorer
  - 1. Listing folders and files
  - 2. Selecting and searching for files
  - 3. File management using Windows Explorer
  - 4. Disk Operations using Windows Explorer
  - 5. Importing and Exporting files
- C. Dimensioning Practices
  - 1. Linear Dimensioning
  - 2. Dimensioning angled surfaces and auxiliary views
  - 3. Dimensioning angles and other features
  - 4. Location Dimensions
  - 5. Dimensioning Formats
  - 6. Adding symbols to text
  - 7. Dimensioning circles, arcs, curves
  - 8. Dimensioning variables
  - 9. Drawing leaders
  - 10. Creating Dimensioning Styles
  - 11. Overriding existing dimensioning variables
  - 12. Editing dimensions
- D. Applying Tolerances
- E. Applying Geometric Dimensioning and Tolerancing
- F. Section Views and Graphic patterns
  - 1. Review types of sections
  - 2. Selecting a hatch pattern
  - 3. Editing a hatch pattern
  - 4. Drawing objects with solid fill
- G. Creating and Editing Blocks
  - 1. Creating symbols as blocks
  - 2. Block insertion options
  - 3. Editing blocks
  - 4. Creating permanent global blocks and symbol libraries
  - 5. Renaming and deleting blocks
- H. External References
  - 1. Defining the function and benefits of XREF's
  - 2. Binding independent objects to a drawing
  - 3. Using XREF's in Multiview Layouts
  - 4. Construction of viewports
  - 5. Creating new layers
  - 6. Controlling viewport layer visibility
  - 7. Adjusting viewport display, size, and location
  - 8. Plotting a multiview drawing
- I. Assigning Attributes
  - 1. assign attributes to blocks and edit
  - 2. create a bill of materials
- J. Isometric Drawing and dimensioning
- K. Introduction to 3-D drawing
  - 1. 3D construction techniques
  - 2. Wireframes, 3-D Faces, 3-D surface models
  - 3. 3-D coordinate system manipulations
  - 4. Using model space viewports
- L. External Commands
  - 1. Generating script files
  - 2. Creating slides and slide shows

#### VI. METHODS OF INSTRUCTION:

- A. **Lecture** -
- B. **Demonstration** -
- C. **Written exercises and case studies** - Written exercises in conjunction with computer analysis
- D. **Classroom Activity** - Hands-on activities and computer laboratory time
- E. Textbook referrals and selected readings from periodicals
- F. individual consultation

#### VII. TYPICAL ASSIGNMENTS:

- A. Reading: 1. Read pgs. 656-662 on drawing leader lines and identify how to access the QLEADER command using the following methods: Toolbar, Pull-down menu, Command: prompt. 2. Study pgs. 756-758 and describe how to draw a datum feature symbol without an attached feature control frame. How do you add a leader line with a filled datum triangle to the symbol? B. Lab assignments: 1. On page 795 of the textbook is a pie chart showing DIAL Technologies' Expense Budget. Use text styles and templates that correlate to problem content. Place dimensions and notes where needed. Make your drawing proportional to the given problem using similar graphic patterns to illustrate. Save the drawing with "your initials" 10. 2. This tutorial is designed to use the office floor plan (Office.dwg) to create an interior plan called Interiors.dwg, consisting of various interior symbols, such as desks, chairs, shelves, and plants. The office floor plan will be referenced into another drawing file through the External Reference dialog box. Follow the accompanying directions and save your drawing with "your initials" 12A.

#### VIII. EVALUATION:

- A. **Methods**
- B. **Frequency**
  - 1. Frequency:
    - a. Weekly assignments and Lab projects

- b. One Midterm and one Final Exam or Design Project
- c. Quizzes as needed

IX. TYPICAL TEXTS:

1. Shumaker, Terence M. and Madsen, David A. *AutoCAD 2000/2000i and Its Applications.*, Goodheart-Willcox Company, Inc., 2001.
2. Leach, James A.. *AutoCAD 2000 Instructor.*, McGraw-Hill, 2000.
3. Stellman, Thomas A. and Krishnan, G.V *Harnessing AutoCAD 2000.*, Autodesk Press /Thomson Learning, 2000.
4. Grabowski, Ralph *The Illustrated AutoCAD 2000 Quick Reference.*, Autodesk Press/Thomson Learning, 2000.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

- A. Two 3 ½" diskettes
- B. Computer use certificate