

VALLEY ROP COURSE OUTLINE

COURSE TITLE:	Computer Drafting
CBEDS TITLE:	Computer-Aided Drafting/Design
CBEDS NUMBER:	5705
JOB TITLES:	Design Technician, Computer Aided 003.362-010 Drafter, Architectural 001.261-010 Drafter, Assistant 017.281-018 Drafter, Apprentice 017.281-014 Drafter, Civil (CAD) 005.281-010 Drafter, Mechanical 007.281-010 Junior Detailer 017-261-018

COURSE DESCRIPTION:

Computer-Aided Design Applications with special emphasis in manufacturing and construction. Students will be exposed to computer-aided design and presentation graphics packages.

HOURS: 360 Hours

PREREQUISITES: None

DATE: December 2000

REVISED: January 24, 2006

CREDITS PER SEMESTER: 10

GRADE LEVEL: 11-12

TEXTBOOKS: *The AutoCADD 2000 Tutor for Engineering Graphics,*
Alan J. Kalameja.

INSTRUCTIONAL METHODS:

1. Lecture
2. Class Discussions
3. Laboratory Work
4. Computer Programmed Instruction
5. Demonstrations
6. One-on-One

EVALUATIONS METHODS:

1.	Lab Exercises	40%
2.	Tests	25%
3.	Final	10%
4.	Final Project (capstone)	15%
5.	Work Ethics (attendance, class prep. Etc.)	<u>10%</u>
		100%

OBJECTIVES:

- Obtain working knowledge in the fundamental principles of CAD
- Perform specific tasks of CAD
- Learn independent work habits
- Make informed career decisions
- Use and understand the terminology related to drafting
- Identify and use proper tools, equipment, and software in drafting
- Understand representation of three-dimensional objects presented on a two-dimensional plane using orthographic projection.
- Describe size as well as shape on a multi-view drawing.
- Produce working drawings for both architectural and mechanical projects.

OBJECTIVES/COMPETENCIES:

Upon completion of this course, students will:

1. Recognize ICONS, MENUS, and COMMANDS.
2. Perform AutoCAD functions such as LINES, ARCS, CIRCLES, POLYLINES, & ELLIPSES with the aid of OSNAPS.
3. Enter coordinates using the ABSOULUTE, RELATIVE and POLAR methods.
4. Create LAYERS that illustrate different lines and colors.
5. Select different FONTS and TEXT SIZES.
6. Apply DIMENSIONS and related NOTATIONS.
7. Create Orthographic View Drawings.
8. Create BLOCKS, SYMBOLS, and ATTRUBUTES.
9. Create drawings by SCALING, PRINTING, and PLOTTING.

COMPUTER DRAFTING COURSE OUTLINE

<u>Major Instructional Units</u> <u>Unit</u>	<u>Hours per Instructional</u>
1.0 Introduction to ROP Program	3
1.1 Introduction to course and facility	
1.1 Overview of program	
1.2 Job and career opportunities in the field	
1.3 Safety and regulations	
2.0 The Personal Computer Hardware and How It Works	3
2.1 Nomenclature of basic hardware	
2.2 How the system operates	
2.3 How to boot system disk	
2.4 Introduction to DOS commands	
2.5 How to boot the CAD system	
2.6 How to copy work files	
2.7 How to transfer computer files	
2.8 Copyright laws	
3.0 Creating and Recovering Work Files	2
3.1 What is a work file	
3.2 How to recover a work file or drawing	
4.0 Creating Drawings	5
4.1 Lines	
4.2 Circles	
4.3 Arcs	
4.4 Other geometric shapes	
4.5 Windows and zoom commands	
4.6 OSNAP and object menus	
4.7 Text and DTEXT	
5.0 Descriptive Geometry	10
5.0 Graphic solutions	
5.1 Edge and true size views	
5.2 Adding geometrical shapes	
5.3 Developments	
6.0 Using Modify, Edit Commands	10
6.1 Deleting information	
6.2 Replacing information	
6.3 Moving information	

6.4	Re-sketching	
6.5	How to copy	
6.6	How to move	
6.7	How to scale	
6.8	How to rotate	
6.9	How to change line density	
6.10	How to use different levels	
6.12	How to change line styles	
6.13	How to change text size	
6.14	How to group objects	
6.15	How to modify object properties	
7.0	Input Modes Using the Keyboard	10
7.1	How to use the absolute mode using numerical values	
7.2	How to use the relative mode with reference to the last plotter point	
7.3	How to use the polar mode to measure and draw angles	
7.4	How to relocate the point of origin	
8.0	Reading Blueprints and Drawings	5
8.1	Importance of blueprints and applications	
8.2	Symbols	
8.3	Schedules	
8.4	Scaling blueprints and computer reduction	
9.0	Shop Process	10
9.1	Terminology	
9.2	Forging, die casting, casting	
9.3	Machining, finishing tolerances	
9.4	Computer aided machine	
9.5	Threads and welding symbols	
9.6	Computer Aided Manufacturing (CAM)	
10.0	Using Dimensioning	15
10.1	How to dimension using decimals	
10.2	How to dimension using cam terminology	
10.3	ANSI dimension standards	
10.4	Dimensioning methods	
11.0	Working Drawings	15
11.1	Purpose of a working drawing	
11.2	Components of a working drawing	

11.3	Detail drawings	
11.4	Assembly drawings	
11.5	Engineering change orders	
11.6	Documentation (Piping and Instrument Documentation)	
11.7	Bills of material (material accounting and selection)	
12.0	Sectional Views	10
12.1	Cutting planes	
12.2	Full sections	
12.3	Half sections	
12.4	Offset sections	
12.5	Section lining symbols	
13.0	Printer and Plotter Operations	10
13.1	Setting up plotting specifications	
13.2	How to set up plotters and printers	
13.3	How to change pens	
13.4	Proper selection of paper	
13.5	Blue printing	
14.0	Auxiliary Views	9
14.1	Reference planes	
14.2	Irregular curves	
14.3	Primary and secondary views	
15.0	Orthographic Projection	20
15.1	Layout and view placement	
15.2	Placement of dimensions	
15.3	Line thickness' and types	
15.4	View visualization	
16.0	Pictorial Drawings	20
16.1	Cabinet, cavalier	
16.2	Isometric	
16.3	Non isometric	
16.4	Curves and ellipses	
16.5	Conventional assemblies	
17.0	Electronic Diagrams	9
17.1	Standardized symbols	
17.2	Schematic diagrams	
17.3	Printed circuit diagrams	
17.4	Block diagrams	

17.5	Creating and using symbol libraries	
18.0	Architectural/Structural Drawings	9
18.1	Architectural scaling measurements and dimensions	
18.2	Creating and using symbol libraries	
18.3	Floor plans	
18.4	Elevations	
18.5	Detailed, Sections	
19.0	CAREER PREPARATION STANDARDS	5
A.	PERSONAL SKILLS - Students will understand how personal skill development affects their employability. This skill includes positive attitudes, self-confidence, honesty, responsibility, initiative, self-discipline, personal hygiene, time management, and the capacity for lifelong learning.	
	1. Demonstrate an understanding of classroom policies and procedures.	
	2. Discuss importance of the following personal skills in the business environment:	
	a. positive attitude	
	b. self-confidence	
	c. honesty	
	d. perseverance	
	e. self-management/work ethic	
	f. pride in product/work	
	g. dependability	
	3. Identify acceptable work attire.	
	4. Establish goals for self-improvement and further education/training.	
	5. Prioritize tasks and meet deadlines.	
	6. Understand the importance of initiative and leadership.	
	7. Understand the importance of lifelong learning in a world of constantly changing technology.	
B.	INTERPERSONAL SKILLS - Students will understand key concepts on group dynamics, conflict resolution, and negotiation. This skill includes the ability to work cooperatively, accept supervision, assume leadership roles, and show respect for others. This standard includes an understanding of sexual harassment laws and an appreciation of cultural diversity in the workplace.	
	1. Identify and discuss behaviors of an effective team.	
	2. Explain the central importance of mutual respect in the workplace relations.	
	3. Discuss and demonstrate strategies for conflict resolution and negotiation, and explain their importance within the business environment.	
	4. Understand laws that apply to sexual harassment in the workplace, and identify tactics for handling harassment situations.	
	5. Work cooperatively, share responsibilities, accept supervision and assume leadership roles.	

6. Demonstrate cooperative working relationships and proper etiquette across gender and cultural groups.
- C. THINKING AND PROBLEM-SOLVING SKILLS - Students will exhibit critical and creative thinking skills, logical reasoning, and problem-solving. These skills include applying basic skills in order to calculate, estimate, measure; identify, locate, and organize information/data; interpret and follow directions from manuals, labels, and other sources; analyze and evaluate information and solutions.
1. Recognize the importance of good academic skills and implement a plan for self-improvement as needed.
 2. Read, write, and give directions.
 3. Exhibit critical and creative thinking skills and logical reasoning skills, and employ these skills for problem solving.
 - a. Work as a team member in solving problems.
 - b. Diagnose the problem, its urgency, and its causes.
 - c. Identify alternatives and their consequences.
 - d. Explore possible solutions.
 - e. Compare/contrast the advantages and disadvantages of alternatives.
 - f. Determine appropriate action(s).
 - g. Implement action(s).
 - h. Evaluate results of action(s) taken.
- D. COMMUNICATION SKILLS - Students will understand principles of effective communication. This standard includes effective oral and written communication, listening skills, following and giving directions, requesting and giving information, asking questions.
1. Use communication concepts in application of skills, techniques, and operations.
 - a. Prepare written material.
 - b. Analyze written material.
 2. Understand and implement written instructions, from technical manuals, written communications, and reference books.
 3. Present a positive image through verbal and nonverbal communication, and understand the power of body language in communication.
 4. Demonstrate active listening through oral and written feedback.
 5. Give and receive feedback.
 6. Demonstrate assertive communications (both oral and written).
 7. Demonstrate proper etiquette in workplace communications, including an awareness of requisites for international communications (languages, customs, time zones, currency and exchange rates).
 8. Demonstrate writing/editing skills as follows:
 - a. Write, proofread, and edit work.
 - b. Use correct grammar, punctuation, capitalization, vocabulary, and spelling.
 - c. Select and use appropriate forms of technology for communication.
 9. Exhibit a proficiency in the use of reference books.

10. Research, compose, and orally present information for a variety of business situations utilizing appropriate technology.
- E. OCCUPATIONAL SAFETY - Students will understand occupational safety issues, including the avoidance of physical hazards in the work environment. This includes the safe operation of equipment, proper handling of hazardous materials, appropriate attire and safety accessories, avoidance of physical injuries, interpretation of warning and hazard signs and terminology, and following and understanding safety-related directions.
1. Discuss and implement good safety practices, including the following (if applicable to course):
 - a. personal
 - b. lab
 - c. fire
 - d. electrical
 - e. equipment
 - f. tools
 - g. interpretation of Material Safety Data Sheets (MSDSs)
 - h. Environmental Protection Agency (EPA)
 - i. Occupational Safety and Health Administration (OSHA)
 - j. American Red Cross Standards (ARC)
 - k. Networking Safety Standards
 2. Apply sound ergonomic principles in organizing one's work space.
- F. EMPLOYMENT LITERACY - Students will understand career paths and strategies for obtaining employment within their chosen field. This includes traditional job preparation skills, such as resumes, application forms, cover letters, sources of employment information, and interviewing skills, but also includes an overview of the industry and an understanding of labor market trends.
1. Explore career opportunities and projected trends; investigate required education, training and experience; and develop an individual education plan.
 2. Identify steps for setting goals and writing personal goals and objectives.
 3. Examine aptitudes related to career options; relate personal characteristics and interests to educational and occupational opportunities.
 4. Develop a career portfolio, including the following documents:
 - a. job application
 - b. resume(s)
 - c. appropriate cover and follow-up correspondence
 5. Identify and demonstrate effective interviewing techniques.
- G. TECHNOLOGY LITERACY - Students will understand and adapt to changing technology by identifying, learning, and applying new skills to improve job performance. Students should understand the role of technology in their chosen field and should be able to use all appropriate technology. Students should also feel confident in their ability to learn new technology by

generalizing from what they know, adapting skills to new situations, and identifying and using sources of information and of further learning.

1. Demonstrate the ability to use personal computers for loading and retrieving data, information gathering, measurements, and writing.
2. Identify the characteristics and explain the importance of adapting to changes, being flexible, and evaluating goals when working in the industry.
3. Understand the importance of lifelong learning in adapting to changing technology.

H. IMPORTANCE OF ETHICS – Students will understand proper ethics in the workplace.

1. Discuss social and ethical responsibilities in the industry.
2. Demonstrate ethical choices in workplace situations.

Community Classroom Hours	90
Cooperative Vocational Education	90
Total Hours	360