DVC
DIABLO VALLEY COLLEGE

DATE DRAFTED: Fall 2016

DVC COURSE: Engineering/Architecture 126 – ENGTC 126 or ARCHI 126

Computer Aided Design and Drawing – AutoCAD (3.0 units CSU/UC)

SCHOOL: Heritage High School
ADDRESS: 101 American Avenue
Brentwood, CA 94513

Secondary Course Name: Design Drafting and/or CAD

COLLEGE COURSE DESCRIPTION:
This introductory course covers the fundamentals of AutoCAD, a computer design drafting program, applied to the creation of technical drawings. Hands-on training utilizing a comprehensive overview of the software package and its applications to architectural drafting is stressed.

A. UNITS: 3.0 **HOURS:** 36 lecture/72 lab

B. PRE-REQUISITES: ENGTC /ARCHI 119 recommended

C. REQUIRED CONTENT FOR ARTICULATION:

(Please see "content" section of attached course outline).

D. REQUIRED COMPETENCIES (PERFORMANCE OBJECTIVES) FOR ARTICULATION

(Please see "objectives" section of attached course outline).

E. METHODS FOR END OF COURSE ASSESSMENT:

Credit by exam: Students must complete a written and online assessment with a grade of 80% or better. The grade/score earned on the college final is the grade place on the transcript by DVC.

F. PROCEDURES AND/OR CRITERIA FOR COURSE ARTICULATION:

1. Complete the ROP CADD Curriculum, at Heritage High School with a grade of "C" or higher.
2. Complete the DVC "Credit by Exam" procedure with a grade of 80% or better.
3. Create a CCCID account to obtain a CCCID# and complete an admission to Diablo Valley College to obtain a Contra Costa Community College Student ID#.
4. Create an account on CATEMA and enroll in the appropriate articulated class.
5. Upon completion of the above, the student will receive on his/her DVC college transcript the unit credit for DVC's ENGT/ARCHI 126.

G. TEXTBOOKS OR OTHER SUPPORTING MATERIALS:

Author: Shih, Randy H.
Title: AutoCAD Tutorial, First Level 2D: Fundamentals
Year: 2015
Book Two
Author: George Omura and Brian C. Benton
Title: Mastering AutoCAD 2015 and AutoCAD LT 2015
Year: 2015

AGREEMENT WAS BASED ON STATEWIDE CAREER PATHWAYS PROJECT TEMPLATE:

☑ **YES** ☐ **NO**

NAME OF TEMPLATE USED:

Intro to Design Drafting using CAD

Articulation agreements shall remain in effect for three years after which they will be subject to review for renewal. Articulation agreement renewals will include a review of the most up-to-date postsecondary and secondary course outlines and a discussion of current teaching methodologies and stated competencies.

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HIGH SCHOOL/ROP/ DISTRICT SIGNATURE	COLLEGE SIGNATURES
High School Principal	College Instructor
High School Instructor/ROP Instructor	Articulation Officer
ROP Principal/Director	Division Dean
District Representative	VP Instruction

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Diablo Valley College Course

ARCHI-126: Computer Aided Design and Drafting - AutoCAD

Description

This introductory course covers the fundamentals of AutoCAD, a computer design drafting program, applied to the creation of technical drawings. Hands-on training utilizing a comprehensive overview of the software package and its applications to architectural drafting is stressed.

Recommended

ARCHI-119 or ENGTC-119 or equivalent

Notes

Same as ENGTC-126. Students may petition to repeat this course when software or hardware is changed. Only the first course completed will be applied toward a degree or certificate requirement. Units for both courses will apply towards the 60 units required for the degree. Credit by Examination option available.

General Information

Department:	Architecture/Engineering
Division:	Physical Science and Engineering
Units:	3.00
Grade Code:	Student choice
Repeatability:	0
Max day class size:	30
Max night class size:	30

Number of Hours

Per Semester

Lecture:	36.00
Laboratory:	72.00
Activity:	0.00

By Arrangement

Lecture:	0.00
Laboratory:	0.00
Activity:	0.00

Objectives/Student Learning Outcomes

Students will be able to:

A. Lecture
1. Describe the workspace and the difference between model and layout spaces.
2. Describe each of the draw features.
3. Describe each of the modify features.
4. Differentiate between all the varying input interfaces.
5. Locate points on a grid using the Cartesian Coordinate System.
6. Describe the unit variables and their uses.
7. Describe the drawing organizational tools, layers and properties, and their importance in drawing organization.
8. Describe the uses of the inquiry tools.

9. Describe the dimensioning parameters and how they are used in a variety of work settings.

A. Laboratory
1. Create drawings.
   a. Create and edit geometry using the dynamic input interface.
   b. Use running object snaps and object snap overrides to select snap points in the drawing.
   c. Use polar tracking and polar snap efficiently and effectively.
   d. Use object tracking to position geometry.
   e. Use the units command to set drawing units.
   f. Create and apply hatch and gradient patterns.
   g. Use and edit polylines.
2. Manipulate objects.
   a. Use several different selecting objects methods to select objects.
   b. Use the objects grips for editing.
   c. Move objects using object snaps, coordinate entry, and object snap tracking for precise placement.
   d. Use the copy, rotate, mirror and array commands.
3. Drawing organization and inquiry commands.
   a. Use layer tools and set parameters using the ByLayer command.
   b. Use the match properties command.
   c. Use the inquiry commands.
4. Alter objects.
   a. Use the offset, fillet and join commands.
5. Work with reusable content.
   a. Design, insert and update using the block command.
6. Annotate and dimension the drawing.
   a. Use the single and multiline text command.
   b. Create and use text styles.
   c. Create and modify dimension styles.
   d. Apply dimensions.
   e. Create and edit multileaders.
1. Working with layouts and plotting (printing).
   a. Create a new layout.
   b. Create and manipulate viewports.
   c. Create and modify page setup.

Content

A. Lecture
1. AutoCAD Overview
   a. Screen Layout, Workspaces and Workspace switching
   b. Quick Access toolbar, Ribbon Tabs and Panels and drop-down Menu Bar
   c. Toolbars, floating vs. docked
   d. Graphics window, Cursor Coordinates and mouse settings
   e. Command Prompt Area and Status Toolbar
   f. Draw and Modify Toolbar Panel
   g. Layers Control Toolbar Panel
   h. Annotation Toolbar Panel
   i. Layout/Model Toolbar
   j. Help, Glossary of Terms
2. Set-up and Format commands in AutoCAD
   a. Start a NEW Drawing
   b. Using the Drawing Setup Wizard
   c. The CAD Database (Templates (.dwt), Design Center)
   d. Drawing UNITS, Precision
   e. Drawing LIMITS
   f. GRID and SNAP option
   g. POINT style
   h. CLOSE, SAVE, SAVEAS, Back-Up (.bak), Drawing (.dwg) and SAVETIME
   i. Cartesian Coordinates
   j. World Coordinate System (WCS)
   k. User Coordinate System (UCS): Polar, Absolute, Relative, ICON Display
   l. COPY/PASTE or Drag/Drop items from one drawing into another drawing
   m. Repeat the Last Command

Writing, problem solving, performance 2:	Using the symbol library of AutoCAD, insert into a simple floor plan the typical symbols found in an architectural floor plan drawing.
Lab, field activity, product or report:	Using AutoCAD complete a drawing of a typical bedroom including windows, doors, closet, and furniture.

Evaluation

Sample One: Develop a CAD drawing based on the structure described in the handout.

Sample Two: How many object snaps (OSnaps) commands are available in AutoCAD?

Frequency of Evaluation: Evaluations will adhere to the DVC "Fairness in Grading" guidelines and will include as a minimum:

- Evaluation of students within the first quarter of the course and notifying student of the results
- Counting a final examination for no more than one-half the course grade
- Basing final grades on at least three students' tests and/or reports

Sample Textbook. See the current course syllabus or bookcenter.dvc.edu for the actual course textbook.

Book One

Author:	Shih, Randy H.
Title:	AutoCAD 2015 Tutorial, First Level 2D: Fundamentals
Publisher:	Prentice Hall
City:	New Jersey
Year:	2015

Book Two

Author:	George Omura and Brian C. Benton
Title:	Mastering AutoCAD 2015 and AutoCAD LT 2015
Publisher:	Thomson Learning Publishing Co.
City:	New York, NY
Year:	2015

Other

Approval Date

Feb 2 2016

n. Page Set-up for PLOTTING
3. Display and Viewing in AutoCAD
   a. Display options ZOOM, GRID, PAN
   b. Selection WINDOW
   c. MODEL space versus LAYOUT space
   d. Using LAYOUT to view print
   e. Creating and working with VIEWPORTS
   f. Creating and Organizing LAYERS
4. Basic Object Construction, Modify and Drafting Settings
   a. DRAW commands: Line, Construction Line, Ray, Polyline, Spline, Circle, arc, Rectangle, Polygon, Ellipse, Point, Divide, Hatch, Multiline
   b. Drafting settings and Drawing aids: ORTHO, OSNAP, POLAR TRACKING, OBJECT SNAP TRACKING, DYNAMIC INPUT
   c. MODIFY commands: Move, Copy, Stretch, Rotate, Mirror, Scale, Trim, Extend, Fillet, Chamfer, Arrays, Erase, Explode, Offset, Lengthen, Edit Polyline, Edit Spline, Edit Hatch, Edit Array, Align, Break, Join, Reverse
   d. Object PROPERTIES
5. Dimensioning and Annotation
   a. Dimensions Nomenclature and Basics
   b. Using Dimension Style Manager
   c. Applying Dimensions to the drawing
   d. TEXT - Single and Multi-line
   e. LEADERS
   f. Parametric Drawing Tools
   g. Applying Geometric Constraints
   h. Applying Dimensional Constraints
   I. Additional Geometric and Dimensional Constructions

A. Laboratory
1. Set-up and Format a NEW drawing in AutoCAD using the Drawing Setup Wizard
2. Using the CAD Database Design Center, OPEN an existing drawing
3. Set the Drawing UNITS and their Precision
4. Set the Drawing LIMITS
5. Set the GRID and SNAP increments
6. Set the POINT style
7. Input settings into the Page Set Up Manager for Plotting (Printing)
8. Activate a new LAYOUT and input settings for Plotting (Printing)
9. Set UCSICON visibility
10. . Set SAVETIME
11. . Save the drawing using SAVEAS
12. . COPY/PASTE or Drag/Drop items from one drawing into another drawing
13. . Use FENCE to select single and multiple objects
14. . Create multiple VIEWPORTS
15. . Creating and Organizing LAYERS
16. . Use DRAW and MODIFY commands to construct objects
17. . Use Dynamic Input methods to assist in constructing objects
18. . Modify Object PROPERTIES
19. . Develop Dimension Styles
20. . Applying Dimensions and Text to the drawing
21. . Plot/Print the drawing

Methods

Lecture, Laboratory, Demonstration, Discussion, Students will have access to software to complete 18 hours of homework assignments during laboratory hours.

Assignments

Reading 1:	Read the chapter on creating building elevations and outline the steps in this process.
Reading 2:	Read the chapter on drawing plan walls and describe the uses on multi-line editing.
Writing, problem solving, performance 1:	Draw and hatch a typical exterior wall section.