

College of San Mateo
Official Course Outline

1. **COURSE ID:** DRAF 110 **TITLE:** SolidWorks I

Units: 3.0 units **Hours/Semester:** 32.0-36.0 Lecture hours; 48.0-54.0 Lab hours; and 64.0-72.0 Homework hours

Method of Grading: Grade Option (Letter Grade or Pass/No Pass)

2. **COURSE DESIGNATION:**

Degree Credit

Transfer credit: CSU

AA/AS Degree Requirements:

CSM - GENERAL EDUCATION REQUIREMENTS: E5d. Career Exploration and Self-Development

3. **COURSE DESCRIPTIONS:**

Catalog Description:

This course covers the fundamentals of computer-aided design and drafting using SolidWorks software, and applications of SolidWorks in creating manufacturing models (parts, assemblies, and drawings) using PC computers.

4. **STUDENT LEARNING OUTCOME(S) (SLO'S):**

Upon successful completion of this course, a student will meet the following outcomes:

1. Construct problem-solving skills to master the creation of drawings and assemblies.
2. Judge and select correct drawing processes and procedures to synthesize and integrate information in drawings and assemblies.
3. Apply the appropriate types, styles and templates of drawing views to various models.
4. Evaluate his/her commitment to personal achievement via the new knowledge gained in this subject.

5. **SPECIFIC INSTRUCTIONAL OBJECTIVES:**

Upon successful completion of this course, a student will be able to:

1. Use SolidWorks software to create solid modeling parts and drawings for the engineering and design industry.
2. Have a firm understanding of ANSI drafting standards and how they relate to the language of drafting in industry.
3. Construct problem-solving skills to master presenting drawings and assemblies.
4. Judge and select correct drawing processes and procedures to synthesize and integrate information in drawings and assemblies.
5. Apply the appropriate types and styles of drawing views to various models.
6. Demonstrate ability to create surface modeling basics such as datum points, datum curves and 3D sketches.
7. Utilize SolidWorks to create complex solid geometry
8. Evaluate his/her commitment to personal achievement via the new knowledge gained in this subject.

6. **COURSE CONTENT:**

Lecture Content:

1. Introduction SolidWorks Toolbars and Menus
 - A. Creating and Saving Files
 - B. The SolidWorks User Interface
2. Sketching Sketch Tools
 - A. Work Planes, Work Axis, Work Points
 - B. Creating Geometry Using Sketch Tools
3. Dimensioning Applying Constraints to Basic Geometries
Modifying and Deleting Dimensions and Constraints
4. Part Creation Part Planning
 - A. Feature Creation Order
 - B. Types of Features
 - C. Solid Features
 - a. Extrude and Revolve
 - b. Sweep and Lofts
 - c. Holes and Shells

- d. Fillets and Chamfers
- 5. Assemblies Assembly File Management
 - A. Creating Assemblies
 - B. Modifying Assemblies
- 6. Drawing Creation Orthographic Drawing Layout for Detailed Drawings
 - Section and Auxiliary Views
 - A. Assembly Drawings Using Balloons and Parts Lists
 - B. Exploded Assembly Drawings
- 7. Printing
 - A. Printing Basics
 - B. Page Setup

Lab Content:

LAB portion of class supports each lecture through design problems that support the given lecture theme.

1. Explore the software to understand SolidWorks Toolbars and Menus
2. Create basic sketches using the Sketch Tools
3. Use appropriate dimensioning constraints to basic solid model geometries and be able to modify, delete dimensions and constraints
4. Drawing problems: create solid models through part planning
 - A. Understanding the Feature Creation Order
 - B. Use of Feature tool bar
5. Assembly part creation and assembly file management
 - A. Creating Assemblies
 - B. Modifying Assemblies
 - C. Planning file management to not lose drawing or parts
6. Orthographic Drawing Layout for Detailed Drawings
 - Section and Auxiliary Views
 - A. Assembly Drawings Using Balloons and Parts Lists
 - B. Exploded Assembly Drawings
7. Printing
 - A. Printing Basics
 - B. Page Setup

7. REPRESENTATIVE METHODS OF INSTRUCTION:

Typical methods of instruction may include:

- A. Lecture
- B. Critique
- C. Discussion
- D. Other (Specify): Reading assignments: Instructor will assign reading/problem solving drawings from course syllabus and each week; Writing assignments: Student will be required to submit one research paper on a CAD related topic. The paper will include a clear general and specific purpose, introduction, body, and conclusion, use of effective organizational format, and smooth transitional devices; Multimedia: Students will watch PowerPoint presentations and analyze them accordingly to theory and concepts presented in class; Critical thinking: i) Lecture/discussion to understand specific processes used in production drawings of the manufacturing and design of products. ii) Students will locate types of evidence in design, architectural, engineering magazines, on line, etc. and evaluate them on criteria for reasonable evidence for their term report.

8. REPRESENTATIVE ASSIGNMENTS

Representative assignments in this course may include, but are not limited to the following:

Writing Assignments:

Assignments are problem solving part creation and drawings

Reading Assignments:

Reading assignments are from the extensive course reader, online tutorials and available texts in the lab.

9. REPRESENTATIVE METHODS OF EVALUATION

Representative methods of evaluation may include:

- A. Class Participation
- B. Class Performance
- C. Class Work
- D. Exams/Tests

- E. Field Trips
- F. Final Class Performance
- G. Final Performance
- H. Homework
- I. Lab Activities
- J. Papers
- K. Portfolios
- L. Quizzes
- M. a. Sketches of Planned Drawings- to reflect students' ability to summarize a strategy in drawing assembly strategies. b. Completion of Timed Assigned Drawings - to demonstrate students' ability to use evidence and reasoning skills to complete work. c. Written Exams - to reflect students' knowledge of theories, concepts, recognize and use evidence and skills presented in class lectures, text and discussions. d. Participation - to demonstrate students' involvement in class discussions, giving feedback on projects to fellow classmates, doing lab projects and homework assignments. e. Final Project - to reflect students' knowledge of theories, concepts, ability to organize information, and apply reasoning skills presented in class discussions, lectures, and text.

10. **REPRESENTATIVE TEXT(S):**

Other:

- A. The following publications available in the Penninsula Library System:
 - Industrial Design magazines
 - Engineering Design magazines
 - Architectural magazines
 - Furniture and product design texts
- B. Recommended text:
 - Planchard, "Engineering Design with SolidWorks." SDC, 2020.

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Course Originator: Valeria Vorobey