ADVM 0001B - COMPUTER AIDED DESIGN FOR MECHANICAL DESIGN AND DRAFTING II

Catalog Description

Formerly known as ADVM 0002
Prerequisite: Completion of ADVM 0001A with grade of "C" or better or equivalent as determined by the instructor
Hours: 90 (36 lecture; 54 laboratory which may be scheduled TBA)
Description: Intermediate concepts of engineering design, including sections, auxiliaries, threads, fasteners, and dimensional tolerancing. Basic concepts of Geometric Dimensioning and Tolerancing. Design for manufacturability and assembly explored to include material selection and properties of materials. This course teaches intermediate 3D CAD skills. Designed for students who have attained a fundamental knowledge of the processes and practices of engineering design/drafting. (CSU)

Course Student Learning Outcomes

- CSLO #1: Apply fundamental parametric Computer-Aided Design (CAD) techniques to develop fully defined CAD models of parts and assemblies
- CSLO #2: Develop design definition documentation of mechanical designs aligned with ASME Y14.5 standards
- CSLO #3: Demonstrate the appropriate use of partial auxiliary views, half auxiliary views, and auxiliary sections and apply them to part drawings to the ASME Y14.5 standards

Effective Term

Fall 2026

Course Type

Credit - Degree-applicable

Contact Hours

90

Outside of Class Hours

72

Total Student Learning Hours

162

Course Objectives

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

1. Specify standard threaded and nonthreaded fasteners
2. Apply assembly modeling using both top-down and bottom-up methodologies
3. Develop a structure and plan strategy for a given product design
4. Describe Product Manufacturing Information (PMI)
5. Apply ASME Standards for Multiview Drawings Engineering drawing from parts and assembly models to develop projected Partial, Auxiliary, Section, Axonometric, Isometric, Oblique, and Perspective views.

General Education Information

- Approved College Associate Degree GE Applicability
- CSU GE Applicability (Recommended-requires CSU approval)
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)

Articulation Information

- CSU Transferable

Methods of Evaluation

- Objective Examinations
  - Example: Example: One of the key guidelines for part design is to insure that a manufacturer specifies quality parts from reliable sources. Describe the "Rule of Ten" and how it affects product cost. This question is evaluated relative to accuracy of knowing what the "Rule of Ten" is and being able to articulate how product cost is influenced.
- Problem Solving Examinations
  - Example: Students are presented with a problematic engineering sketch of a Pulley. Students must analyze the sketch to determine optimum methods for 3D modeling the item, then develop the correct orthographic and section views along with complete dimensioning per ASME standards. This is evaluated by the instructor in accordance with current industry standards.
- Projects
  - Example: Students are presented with partial design criteria for a working assembly. Students must research correct components to include and develop a complete set of working drawings in compliance with ASME standards. This project is evaluated by comparison to current industry standards for development of working drawings.
- Skill Demonstrations
  - Example: The weekly and semester drawings are examples to assess the depth of topic coverage and critical analysis for each student. A faculty member evaluates the student performance of learned objectives such as technical sketching, representation of sectional and auxiliary views, orthographic representation of design intent, accuracy to ASME standards for prototype development and the efficient use of a computer system. A point system is used and a letter grade assigned to the point totals.

Repeatable

No

Methods of Instruction

- Laboratory
- Lecture/Discussion
- Distance Learning

Lab:

1. Instructor will lead students through the development of Section Views for technical documentation. Students will develop their own

appropriate section views for each assigned part. The resulting Technical Drawings will be assessed based on current Industry standards.

Lecture:

1. Instructor will present to the students during lecture/presentation/discussion intermediate engineering design methodology that the student will synthesize and apply to assigned problems and then formulate a solution utilizing correct engineering design methods.

Distance Learning

1. Instructor will make a how-to tutorial regarding the application of geometric symbols to part features on drawings. Students will be expected to follow the step-by-step instructions and re-create the features on the drawing.

Typical Out of Class Assignments Reading Assignments

1. Students read textbook chapter on Auxiliary View Development then Construct a drawing, based upon course readings, demonstrating the learning objectives. The drawings are evaluated for compliance with ASME standards. Critical thinking and problem solving are part of these assignments. 2. Search the Internet for articles that reference Design for Manufacture and Assembly and be prepared to discuss with the group.

Writing, Problem Solving or Performance

1. Compare and contrast methods employed in Design for Manufacture and Assembly- report either written or orally upon return to the lecture. 2. Problem solve the construction of 3D solid models and the relationship of geometry for feature definition.

Other (Term projects, research papers, portfolios, etc.)

1. Develop a portfolio that contains samples of semester assignments to show potential employers the engineering design concepts studied. 2. Participate as a member of a design team for the completion of a semester design project.

Required Materials

- Fundamentals Of Solid Modeling and Technical Graphics Communication
  - Author: Bertoline, Hartman, Ross
  - Publisher: McGraw Hill
  - Publication Date: 2018
  - Text Edition: 7th
  - Classic Textbook?:
  - OER Link:
  - OER:
- Parametric Modeling with SOLIDWORKS 2024
  - Author: Shih, Schilling
  - Publisher: SDC Publications, Inc.
  - Publication Date: 2024
  - Text Edition: 18th
  - Classic Textbook?:
  - OER Link:
  - OER:

Other materials and-or supplies required of students that contribute to the cost of the course.