

CAD 241

Revised Spring 2019

CAD 241
Parametric Solid Modeling I

Prerequisites:

CAD 111 – Technical Drawing I

Course Description:

Focuses on teaching students the design of parts by parametric solid modeling. Topics covered include, but are not limited to, sketch profiles; geometric and dimensional constraints; 3-D features; model generation by extrusion, revolution and sweep; and the creation of 2-D drawing views that include sections, details and auxiliary. Part I of II. (Credit will not be awarded for both CAD 241 and DRF 241.)Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week. Course applies the theory and application of industry standards; Course utilizes AutoDesk CAD software and AutoDesk Certification materials.

Required Materials:

Textbook:

Autodesk Inventor 2019 and Engineering Graphics, An Integrated Approach

Randy H. Shih

978-1-63057-202-0

Recommended additional Materials:

USB portable, Stapler, Pencil Sharpener

To complete assignments outside the classroom, the student will need access to a current computer and a high-speed internet service and media player.

The following supplementary materials are available:

VWCC offers an open computer lab format available throughout each semester if needed. Autodesk provides each student with access to a downloadable full version of the AutoCad program. The student can download the program onto their personal computer from the storage site provided.

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Course Outcomes:

- A. Knowledge of 3D techniques in design and manufacturing
- B. Knowledge of Sketching geometry with constraints, tolerances, and dimensions
- C. Knowledge of the introduced CAD software, including the interface and environment.
- D. Create base features and placed features, and use modification tools.
- E. Create solid models using adaptive and parametric 3D tools
- F. Understand “design intent” and “reverse engineering” to create models from existing parts.
- G. Create 2D detailed production drawings with industry standard ASME dimensions from 3D parametric parts.
- H. Create assemblies using multiple parts and assembly constraints
- I. Create exploded assemblies from presentation file.

Topical Description:

Week	Topics
1	Welcome, Review Syllabus and course materials, Warm up Exercise, ASME Dimensions, Sketching, and Detailed Drawings; Project 1 Introduction “Design Intent”
2	Industry Standards, Detailed Drawings Review, 3rd Angle Projection, Warm up Exercise, ASME Dimension Review, Review Applications
3	TEST 1 – ASME Dimensions, Industry Standards and Basic 3D
4	Introduction to AutoDesk INVENTOR; Interface, Inventor Sketching/Features Design; Constraints; Extrude; Project 1 review
5	Basics Modifications, Placed Features vs. Sketched Features
6	Basics Modifications, Placed Features vs. Sketched Features
7	Additional modeling techniques, 2D Drawing Views: Drawing Sheets, Adding ASME dimensions to Drawing Views
8	Project 1 Due; Special Group Project 2 Introduction “Reverse Engineering”, Review Applications
9	Test 2, Project 2 Object approval due; Project 2 work
10	Assemblies and Presentation files; Project 2 continued
11	Advanced modeling applications, Project 2 continued
12	Advanced modeling applications, Project 2 continued
13	Project 2 - Putting it all together, Presentation files
14	Project 2 continued
15	Project 2 continued
16	Final Exam, Project 2 Presentation to class

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Notes to Instructors:

- Usage of ASME industry standards for dimensions is required
- Each student will be required to complete weekly in-class assignments, out of class assignments and special projects for class presentation.
- (Inventor) ACU Certification materials used in course materials.