

CAD 242

Revised Spring 2019

CAD 242
Parametric Solid Modeling II

Prerequisites:

CAD 111 – Technical Drawing I

Course Description:

Focuses on teaching students the design of parts by parametric solid modeling. Topics covered will include, but 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. Course applies the theory and application of industry standards; Course utilizes SOLIDWORKS and AutoDesk CAD software and AutoDesk Certification materials. (Credit will not be awarded for both CAD 242 and DRF 242.) Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

Required Materials:

Textbook(s):

SOLIDWORKS 2019 and Engineering Graphics, An Integrated Approach

Randy H. Shih

978-1-63057-240-2

Autodesk Inventor 2019 and Engineering Graphics, An Integrated Approach (Also used in CAD 241)

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.

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The following supplementary materials are available:

VWCC offers an open computer lab format available throughout each semester if needed in M302.

AutoDesk provides each student with access to a downloadable full version of the AutoCad program. The student can download the Autodesk program onto their personal computer from the storage site provided. SolidWorks software can be accessed online and downloaded as a trial version.

Course Outcomes:

- A. Knowledge of advanced 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.
- J. Usage additive manufacturing (3D printing) to create physical models of virtual solids.

Topical Description:

- A. Review skills regarding Basic Technical drafting and
- B. Review precision ASME Dimensions with Tolerances and Constraints, threads and shaft centers
- C. Introduce the SOLIDWORKS software techniques and applications
- D. Introduce advanced AutoDesk INVENTOR techniques and applications
- E. Drafting techniques includes, but not limited to:
 - Dimensioning for fits
 - Threads and shafts centers
 - Shop Processes and casting
 - Machine parts
 - Threads and Fasteners
 - Working drawing generated from software
 - Revolutions
 - Various Techniques in Design

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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.
- Certification materials used in course materials.
- 3D printers are available for usage on campus (FABLAB)