IDP151 Introduction to Solidworks

Schedule: January 12 thru 15(16) 2015
Instructor: Eric Jensen, ejensen@smith.edu, Susannah Howe, showe@smith.edu

Overview: SolidWorks (SW) is a 3D modeling system for Computer Aided Design (CAD). CAD modeling is focused on creating technical models and drawings most used by product designers and engineers. SW is a powerful, professional-level product that can help a designer take an idea from concept through design, testing, and manufacture. It has many capabilities beyond simply modeling, including kinematics, stress analysis, fluid/heat flow and animations. Many engineering and design employers use SW or similar competitor products so knowing SW will make you more competitive during a job search.

In this class you will be introduced to the basic modeling and design features of the software. No previous experience will be necessary; be aware, however, that this is a complex software so basic computer familiarity will be important.

Schedule:
January 12 - 15, 2015. 9:00 AM to 4:00 PM (Lunch 12-1)
These four days comprise the primary class. At the end of this class you will know the basics of modeling, creating assemblies, and drawing. Class activities include mini-lectures, hands-on workshops and labs, and informal quizzes.

January 16, 2015. 9:00 AM to 4:00 PM (Lunch 12-1)
This is an optional bonus day. You will learn advanced assembly techniques and be introduced to SW analysis tools. The techniques we will cover are based on a design methodology known as *top-down design* which is really how we think when we design something. *This day is required if you are planning to follow up this class with the CSWA course.*

CSWA course: A new option this year will be to extend your learning beyond this class using online course materials that Smith has contracted to use. The goal of taking more training will be preparing to take a certification test known as the *Certified SolidWorks Associate* in the end of March. Getting a CSWA certificate is a excellent way to show possible employers your skill level in SW. During this course we will assign short assignments for you to complete on your own time with milestones every two weeks. After spring break we will proctor the CSWA test to complete the course. There will be a cost of $75 to cover the online training materials. The test normally costs $100, but is free based on our contract with SW, so it's a good value! More details regarding this option will be

discussed on Monday of the primary class. **IMPORTANT - the CSWA component is an optional followup, and is not required or a part of IDP151**

Class Requirements: Attendance is mandatory for the four days of the class. The fifth day (bonus!) is open to anyone in IDP151, but required for those who are planning on joining the CSWA course. Each day builds on the work of the previous, so missing a day or joining late cannot be allowed.

Grading: Class is graded S/U. Passing assumes full attendance for the 4 days and demonstrating a committed effort to learn the software.

Day 1 - Intro to Parts

- Intro lecture, review syllabus, and extended class option (friday and CSWA)
- Explore interface, explain nomenclature of parts of the interface, draw graphic explaining this, and post)
- Part modeling - basic sketching (lines, rectangles, circles, arcs, smart dimension, basic relations)
- *Lunch*
- Sketching - overdefined sketches, fully defined sketches
- More sketch tools (mirrors, patterns, convert entities, offset, fillet, chamfer, trim)
- Geometric relations

Day 2 - Intermediate Parts

- *Quiz* - interface nomenclature, sketching, relations.
- Part modeling - extrudes(boss,cut), thin features, revolves(boss,cut)
- Part modeling - revolves, sweeps
- *Lunch*
- Part Modeling - features (planes, pattern, mirror, fillet, chamfer, shell)
- *Lab* - make several parts using above concepts
- Part Modeling - editing sketches, editing features, feature order (rollback)

Day 3 - Assembly

- *Quiz* - Make a part using extrude and revolve, and pattern/mirror
- Introduction to assemblies
- Assemblies - starting one, inserting components, basic coincident mates
- *Lab* - assemble two parts made from previous labs
- Mates - coincident, tangent, concentric, advanced mates, coordinate systems
- *Lunch*
- Appearances, interference detection, mass properties
- Hole wizard (in parts and assembly)
- Insert toolbox components

- Assembly Bill Of Materials

Day 4 - Putting It All Together, and Intro to Drawings

- *Quiz* - assemble pre-made parts, use mates, planes, WCS
- *Lab* - create a multi part assembly that uses fasteners and a part downloaded from McMasterCarr. Model all parts, assemble.
- *Lunch*
- Intro to drawings - (basic 3 view, model items annotations, smart dimensions)
- *Lab* - make drawings for parts and assembly created in the morning lab
- Final thoughts, class surveys

Day 5 - **Bonus day**, Top-down Design, other SW tools and CSWA

- Overview of requirements/goals for extended class culminating in the CSWA test
- Top-down design and design intent
- *Lab* - simple two part top down design
- *Lunch*
- Modifying parts and assemblies (feature order, rollback, suppress)
- Equations and global variables
- *Lab* - modify existing work, using above concepts
- *Optional demo* - motion, static analysis