



**Architectural and Engineering Design Department (AEDD) South Portland, Maine
04106**

Title: Parametric Modeling -SolidWorks Catalog Number: AEDD170
Credit Hours: 3 Total Contact Hours: 60 Lecture: 30 Lab: 30
Instructor: Nevin Rallis email :NRallis@smccme.edu

Course Syllabus

Course Description

This course will provide an overview of parametric solid modeling software for mechanical applications using SolidWorks. Students will learn to use sketch planes to create 3-D solid models, add features, build complexity into their models, and create detailed drawings of single parts based on current ASME Y14.5M standards. We will build assemblies from multiple part files, and create presentation files illustrating design concepts.

Prerequisites: AEDD100 or AEDD105.

Course Objectives

After completing the course, the student will be able to:

1. Demonstrate an understanding of the SolidWorks interface.
2. Create, constrain, and dimension accurate sketches on 2-D reference planes.
3. Manage Project files
4. Modify existing sketches.
5. Create accurate 3D part models from existing 2-D sketches.
6. Create 2D sketches on surfaces to generate separate 3-D features.
7. Demonstrate efficiency in the creation and modification of sketched geometry.
8. Create fillets, chamfers, holes, shelled models, and mold drafts.
9. Create rectangular and circular patterns of features.
10. Create detailed drawings with annotations of parts that meet ASME standards.
11. Assemble multiple components using assembly constraints.
12. Produce detailed exploded assembly views with Bills of Materials.
13. Manage the relationship among models, assemblies and drawing files.
14. Analyze Parts using the range of tools available in SolidWorks and available plugins
15. Develop and produce a complete design project: parts, assembly, and drawing files.

Topical Outline of Instruction

1. Overview of parametric modeling, relationship with CNC, file management, 2D sketching, constraints, dimensioning, modeling, presentation models, and drawing creation
2. Creating and constraining accurate sketched features on work planes
3. Creating part models from sketches using extruded and revolved features
4. Creating fillets, chamfers, holes, threads
5. Rectangular & circular patterns
6. Swept and lofted features
7. Creating and Editing Drawing Views
8. Creating and Documenting Assemblies: constraints, build approach, editing
9. Midterm Exam
10. Sub Assemblies and top-down assemblies
11. Presentation files, exploded views, and animation
12. In context external references – adaptivity between parts in assembly
13. Introduction to weldments and part libraries using SolidWorks toolbox

14. Design process – individual projects
15. Final Project submission

Course Requirements

1. Active attendance and participation in class.
2. Completion of all assignments, and exercises
3. Completion of a Final Project.

Student Evaluation and Grading

Final grade will be calculated from completed projects (60%), tests (20%) and the final project (20%). See Department Policies below.

Text, Tools, and/or Supplies

Textbook: Solid Professor Premium (Available in SMCC bookstore only) and the Help System
Backup copies of all work must be stored on removable media.

Department Policies

1. Grading – grading policies may vary by instructor

A	4.00	9.3-10
A-	3.67	9-9.2
B+	3.33	8.7-8.9
B	3.00	8.3-8.6
B-	2.67	8-8.2
C+	2.33	7.7-7.9
C	2.00	7.3-7.6
C-	1.67	7.0-7.2
D+	1.33	6.7-6.9
D	1.00	6.3-6.6
F	0.00	>6.3 FAILURE
P	NONE	Equivalent to a "C" (2.0) or better
AF	0.00	Administrative Failure
I	None	Incomplete*
W	None	Official Withdrawal from course
NS	None	Failure to appear for any session of class

*Incomplete grades are given at the discretion of the Instructor. Incomplete grades may only be given after an incomplete contract between the instructor and student has been signed and submitted to Enrollment Services. Students may withdraw from a class up to the twelfth week into the semester to avoid a failing grade. Make note of the class withdrawal deadline date and time in the student handbook and academic calendar on the portal.

2. Work submitted that does not meet standards will be given and "N/A Resubmit". Instructions on how to correct your work will be provided through "Redlines" (comments by instructor). All "Redlines" must be addressed before resubmitting the assignment. NO PARTIAL credit will be given unless all Redlines have been corrected.
3. **Late work** will drop a letter grade per week late. Assignments turned in more than 4 weeks late will result in a failing grade for that assignment. Completion of all assignments is required.
4. Any student who submits work done by someone else will at the least, receive a failing grade for that assignment and must redo the assignment. Should the instructor see fit, the student involved will be reported to the Dean of Students in violation of the

Student Code of Conduct which will result in the student receiving a failing grade for the class.

5. Any activity, conversation or behavior that is not considered appropriate for the classroom or professional environment will result in the request that the behavior cease. If it does not, the student(s) involved will be dismissed from class and referred to the dean of Students and may not return to class until they have met with the Dean of Students, Department Chair and Instructor.
6. Use of cell phones, and other electronic devices during class which are not for class purposes is prohibited. Cell phones **do not** need to be turned off, but should be set to **vibrate** or **silenced** during class. Class time is for class activities only.
7. Personally owned computers are not required to be successful in this program, however they are highly recommended. All students have access to free Autodesk software downloads available at <http://students.autodesk.com/>. If you do not have access to your own computer to complete your homework, computer labs are available during open building hours 8:00 AM – 9:30 PM M-F. At least 3-9 hours of homework time outside each 3 credit course is normal and to be expected.
8. Hours for faculty members are posted on the faculty member's door. You may also make appointments with faculty via e-mail.
9. Only SMCC E-mail addresses will be used by faculty to communicate to students. E-mails between student and faculty must meet the following criteria:
 - a. The subject line has the **class code** along with a reference to the e-mail subject
 - b. E-mails must be signed with the student's full name as it appears on the class list.

See the full e-mail etiquette policy in **R:\General\Department Policies**.

10. **Attendance policy** – attendance is taken at the beginning of each class. If the student is late for a class it is the responsibility of the student to review their attendance and make sure that they have been marked Tardy rather than absent. There are no excused absences. Students are either present or absent.
 - a. **For classes that meet once a week** – no more than 3 unexcused absences are allowed **total**, no more than 2 classes may be missed **in a row**. A student who misses a class will receive a warning e-mail; if two weeks in a row are missed without communication the student will receive an Administrative Fail (AF) for the class. A student who has a total of 3 classes will receive an AF.
 - b. **For classes that meet twice a week** – no more than a total of 5 unexcused absences are allowed; no more than 3 classes may be missed **in a row**. If a student fails to attend two classes in a row he/she will receive a warning e-mail. If no correspondence has been made and the student fails to show for the third class in a row, the student will receive an AF for the class. Students that have missed a total of 5 classes will receive an AF.
 - c. It is the responsibility of the student to make sure to get the course materials and assignments that were covered during his/her absence. Assignment due dates **WILL NOT BE ADJUSTED DUE TO AN ABSENCE**. See late work policy above.
11. All students are expected to take notes and maintain them for reference purposes throughout the class and future classes. Students must also be responsible for their own backup of course work. If work is lost it is **NOT** the AEDD responsibility to replace or find it.

12. All work must follow the Technical Graphics Standards Manual for the AEDD. A copy of the manual has been placed in R:\Standards Various Sources

End-of-Course Evaluation

Students complete evaluations for each course attended at SMCC. Evaluations are submitted online and can be accessed through the student portal. Students can access the course evaluations beginning one week before the end of classes. The deadline for submission of evaluations occurs Monday at 5 p.m. following the last day of the class. You will receive an e-mail to your student e-mail account when course evaluations are available.

ADA Syllabus Statement

Southern Maine Community College is an equal opportunity/affirmative action institution and employer. For more information, please call (207) 741-5798. If you have a disabling condition and wish to request accommodations in order to have reasonable access to the programs and services offered by SMCC, you must register with the Disability Services Coordinator, Sandra Lynham, who can be reached at 741-5923. Further information about services for students with disabilities and the accommodation process is available upon request at this number. Course policies about online testing are modified to suit each individual's accommodations.

SMCC Pay-for-Print Policy

Each semester students receive a \$20 printing credit. The balance resets at the end of the semester and any remaining credits are removed. The College's pay-for-print system monitors printing on all printers (including those in general access labs, library printers, Tutoring Services, Campus Center Lounge and technology labs). Be sure to log OUT of the system when you've finished your printing, to prevent unauthorized access to your account. Students can check the number of pages they have printed by using the Printing Balance tool available on SMCC computers (located in the lower right corner of the screen, near the clock). Departments with work study students who need to print documents for the department should contact the Help Desk at 741-5696 to have a special account set up. To find ways to reduce your printing charges, please go to the IT Help tab on My SMCC. If you have questions about the pay-for-printing policy or your printing charges, please contact the Help Desk at 741-5696 or send an e-mail to helpdesk@smccme.edu.

Refunds

Print jobs are eligible for a refund in the event of mechanical or electronic error on the part of the printer, print server, or software used to submit the job. Jobs are not eligible for a refund in cases where the job was not set up correctly, was submitted multiple times, or the student is not satisfied with the result. To request a refund, please bring the offending print to the IT Department in the basement of the Ross Technology Center. Refunds will be granted in the form of a credit to the student's account.

Add-Drop Policy

Students who drop a course during the one-week "add/drop" period in the fall and spring semesters and the first three days of summer sessions receive a 100% refund of the tuition and associated fees for that course. Please note any course that meets for less than the traditional semester length, i.e., 15 weeks, has a pro-rated add/drop period. There is no refund for non-attendance.

Withdrawal Policy

A student may withdraw from a course only during the semester in which s/he is registered for that course. The withdrawal period is the second through twelfth week of the Fall and Spring semesters and the second through ninth week of twelve-week Summer courses. This period is pro-rated for shorter-length courses (usually 75 percent of course meeting times; please check with the Registration Office. To withdraw from a course, a student must complete and submit the appropriate course withdrawal form, available at the Registration Office. This process must be completed either in person or by using SMCC e-mail accounts.

Plagiarism Statement

If an instructor suspects that a student has knowingly committed a violation defined in the Maine Community College System Policy on Student Grade Appeals and Academic Misconduct, the instructor has the authority to review the alleged misconduct and determine the grade that the student should receive for the assignment and the course. The instructor may assign a failing grade for the assignment or course and may require the student to complete additional work for the course. The instructor may consult with the department chair and/or the College's chief academic officer prior to making such decisions. If a student seeks to challenge an instructor's determination, the student should submit a grade appeal. Grade appeal forms are available in the Advising Office on the South Portland Campus or in the administrative offices in the Learning Commons on the Midcoast Campus. An instructor may also refer the matter to the College's disciplinary officer for review under the procedures of the MCCS Student Code of Conduct

Lesson Plan, Spring, 2012
AEDD-170
Southern Maine Community College

Parametric Modeling with SolidWorks –

Notes:

- 1. We have a SolidWorks license that allows students to download an educational copy. I will send you a link for doing that to your SMCC email address.*
- 2. The required text for this course is "Solid Professor," available in the bookstore. This gives you on-line access for twelve months to an excellent and extensive series of short videos that would normally retail for hundreds of dollars. You must register using the site information and credentials in the packet you buy. Watch all assigned*

videos (only a portion of the available videos are assigned) and review them thoroughly as necessary. Take the two exams online when you are ready (prior to class 13). I will check to determine that you've run each video as part of my assessment of your performance. There are over 120 assigned videos, but they average only 2.6 minutes in length.

- 3. File management in SolidWorks requires an approach that differs from general file management. See the handout "SolidWorks General Notes.pdf" and watch the five SP videos in "2011 File Management." Place ALL related files in a single folder.*
- 4. You must submit projects for each unit, based on class instruction and handouts.*
- 5. A final design project with multiple parts in assembly is required, to be based on criteria provided in class. Start thinking about it early.*

Unit 01: Overview of parametric modeling, contrast with geometric modeling in AutoCAD, relationship with CNC, file management, 2D sketching, constraints, dimensioning, modeling, presentation models, and drawing creation.

SP Lessons: 2011 Core Concepts → Introduction → All Segments
2011 Core Concepts → The Sketcher → All Segments

Project: Complete the "Introduction to SolidWorks" tutorial in the software.

Unit 02: Overview of Parts

SP Lessons: 2011 Core Concepts → Sketched Features → All Segments
2011 Core Concepts → Parts → Introducing Parts through Picking a Plane

Project: Complete all parts for Caster Assembly

Unit 03: 1 Overview of Assemblies

SP Lessons: 2011 Core Concepts → Assemblies → "Overview" through "Tangent Mate"

Project: Complete Caster Assembly

Unit 04: Overview of Drawings

SP Lessons: 2011 Drawings → 2011 Drawings → "Overview" through "Assembly Section View"

Project: Create drawing of assembly with full section, BOM, and balloons

Unit 05: Optional Design problem: prism holder

Unit 05: Intermediate Parts

SP Lessons: 2011 Core Concepts → "Applied Features" all sections
2011 Core Concepts → "Parts" all Configurations and Design Tables

Project: Create All Parts for Trolley

Unit 06: Intermediate Assemblies

SP Lessons: 2011 Core Concepts → Assemblies → "Smart Mates" through "Interference Detection"

Project: Create Trolley Assembly

Unit 07: Intermediate Drawing

SP Lessons: 2011 Drawings → 2011 Drawings → "Detail View" through "Notes"

Project: Create a drawing file for each part in the Trolley Assembly, Annotated as Specified by instructor

Unit 07: *Mid-term Exam -- Final Project Proposal due*

Unit 08: Creating and Editing Drawing Views with Custom Templates

SP Lessons: 2011 Drawings → 2011 Drawings → "Custom Templates" and "Sheet Formats"

Project: Create custom sheet formats and template using AutoCAD title block drawings for both ASME inch and metric drawings

Unit 09: Presentation files, exploded views, and animation

SP Lessons: 2011 Core Concepts → Assemblies → "Exploding Assemblies"

2011 Drawings → 2011 Drawings → "Exploded View"

Project: Explode and animate the Trolley Assembly
Explode and add sketch lines to the wheel sub-assembly

Note: complete both on-line exams prior to beginning the tutorials.

Unit 11: Additional Tutorials

SP Lessons: 2011 Advanced Parts → "3D Sketching Intro" through "3D Sketch Planes" and "Derived Sketches"

2011 Weldments → "Introduction" and "Structural Members" and others as needed

2011 Sheet Metal → "Introduction" and others as needed

2011 Surfacing → "Introduction" and "What's a Surface" and others as needed

2011 Simulation → "Introduction" and others as needed

Project: See handout for required and optional tutorials

Unit 12: Design process – individual projects three weeks

SP Lessons: Solid Professor and SolidWorks Help system as needed

Unit 13: Final Project Due

Introduction to Certified Solid Works Associate exam

SP Lessons (optional): SolidWorks Certification

Last Class – Final Exam