

Catalogue Description Concepts of computer-aided design in 2-dimensions and 3-dimensions. Creating advanced parts using extrusions, surfaces, and equation driven sketches. Forming assemblies, and sub-assemblies, for motion analysis.

Objective This course will introduce you to one of the CAD tools widely used in industry today. The tool will be SolidWorks. This tool will introduce the concepts of sketching, part assembly, drawings, assemblies, motion tools, and a finite element analysis tool. The course will implement the SolidProfessor teaching content designed to aid in the self-learning of concepts, eventually leading to the Certified SolidWorks Associate Develop certification.

Prerequisites None, but recommended preparation includes: MATH 245, and some strength of materials knowledge

Instructor Raymond Kim (raymonmk@usc.edu)

Hours 2 hours and 50 minutes per week

Course Structure The course will consist of:
Weekly Homework Assignments
Weekly In-class Lab Assignments
Midterm Exam
Final Project

Textbook(s) All course material will be available through SolidProfessor (www.solidprofessor.com)

Grading	The course is graded with the following weights:	
	Homework	20%
	Labs	30%
	Midterm Exam	20%
	Final Project	30%
	TOTAL POSSIBLE	100%

Final Project The final project will be a cumulative project that requires the use of learned material during the semester. The project will be worth 30% of the overall grade and will be an individual project.

Requirements:

You will create an assembly of your choice. The assembly must feature at least 5 different parts, with more than 10 different features (cuts, extrusions, surfaces, etc.) for each part. The assembly must be completely constrained with physical limitations accounted for (colliding parts, over-rotation, etc.).

You must submit a proposal that outlines your proposed final project along with a list of parts that make up the assembly. Preliminary sketches or photographs must be provided as well as any supporting documentation for your build.

You will create a photo-realistic render of the assembly and create an animation of the assembly. You will present your final project during the assigned final time and discuss the design process along with any trade studies that were conducted.

Total points: 100

20 Points – Proposal

20 Points – Presentation

60 Points – Assembly and Part Files

Grading Scale	Letter grades will be assigned according to the following scale:	
	93%+	A
	90-92%	A-
	87-89%	B+
	83-86%	B
	80-82%	B-
	77-79%	C+
	73-76%	C
	70-72%	C-
	69	D+
	67-68	D
	66	D-
	65 and below	F

Homework Homework and lab assignments will be given weekly. Students will submit all of their homework assignments and labs through Blackboard only. No email submissions will be counted towards a student's grade.

Late work will be accepted up to two days after the due date of the assignment or lab.

0 – 24 hours Late: 80% maximum credit

24 – 48 hours Late: 65% maximum credit

>48 hours late: 0% maximum credit

Policies *Make-up policy for exams:* To make up for a missed exam, the student must provide a satisfactory reason (as determined by the instructor) along with proper documentation. Make-up exams are generally only offered in emergency situations.

Before logging off a computer, students must ensure that they have saved any work to either a USB drive or a service such as Dropbox. Any work saved to the computer will be erased after restarting the computer. ITP is not responsible for any work lost.

ITP offers Open Lab use for all students enrolled in ITP classes. These open labs are held beginning the second week of classes through the last week of classes. Hours are listed at: <http://itp.usc.edu/labs/>.

Statement on Academic Conduct and Support Systems

Academic Conduct

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, *Behavior Violating University Standards* <https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct/>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity* <http://equity.usc.edu/> or to the *Department of Public Safety* <http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us>. This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Center for Women and Men* <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage sarc.usc.edu describes reporting options and other resources.

Support Systems

A number of USC’s schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* <http://emergency.usc.edu/> will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.

A Further Note on Plagiarism

In this class, all homework submissions will be compared with current, previous, and future students’ submissions. If your work is found to be a copy of another person’s work, or if you submit someone else’s work as your own, I will not hesitate to file a report with SJACS with a recommended penalty of an F in the course.

Do not give other student’s your SolidWorks files. This is the easiest way to avoid plagiarism. In the case that files have been shared, all students involved will receive the same penalty and no distinction will be made between those who submitted another person’s work, and those who shared the file.

Course Outline		
Week	Topic(s)	Reading/Homework
1 Jan 12	SolidWorks Interface; Sketches; Parts	<i>SolidWorks 101: Lesson 1,2,3</i> Assignment 1: Sketching Basics Lab 1: Shears Sketches
2 Jan 19	Extrusions; Boss/Bass; Sweeps; Patterns; Ribs/Shells; Chamfer; Planes	<i>SolidWorks 101: Lesson 4</i> Assignment 2: Basic Part Creation Lab 2: Simple Parts Assignment 1 Due
3 Jan 26	Assemblies; Assembly Features	<i>SolidWorks 101: Lesson 5</i> <i>Core Concepts: Assemblies</i> Assignment 3: Advanced Parts Lab 3: Basic Assembly Assignment 2 Due
4 Feb 2	Drawings; Section Views; Annotations; BOM	<i>Drawings</i> Assignment 4: Assemblies Part 2 Lab 4: Advanced Assemblies Assignment 3 Due
5 Feb 9	3D Sketching; Derived Sketches; Auto Trace	<i>Advanced Parts: Advanced Sketching</i> Assignment 5: Assembly Drawings Lab 5: 3D Sketches in Parts Assignment 4 Due
6 Feb 16	Lofts; Boundary; Dome; Wrap; Sweeps	<i>Advanced Parts: Sweeps, Lofts, Dome and Wrap, Boundary</i> Assignment 6: Advanced Part Creation II Lab 6: Bowling Pin Assignment 5 Due
7 Feb 23	CSWA: Parts	<i>SolidWorks 101: Lesson 7</i> Assignment 7: Advanced Part Creation III Lab 7: Sample CSWA Part Questions Assignment 6 Due
8 Mar 1	CSWA: Assemblies	<i>SolidWorks 101: Lesson 8, 9, 10</i> Lab 8: Sample CSWA Assignment 7 Due
9 Mar 8	Midterm: CSWA	

	SPRING BREAK	
10 Mar 22	Strength of Materials; Simulation of Loads; Factor of Safety	<i>SolidWorks 101: SimulationXpress</i> Assignment 8: Strength of Materials Lab 9: Generating Reports
11 Mar 29	Surfaces	<i>Surfacing Essentials</i> Assignment 9: Helmet Lab 10: Simple Surface Parts Assignment 8 Due
12 Apr 5	Assembly Features; Component Patterns; Advanced Mates	<i>Advanced Assemblies: Assembly Features, Component Patterns, Advanced Mate Types</i> Assignment 10: V12 Engine Assignment 9 Due
13 Apr 12	Scenes; Lights; Cameras	<i>Visualization and Appearances</i> Work on Final Project Assignment 10 Due
14 Apr 19	Motion and Animation	<i>Workshop: Motion and Animation</i> Work on Final Project
15 Apr 26	Decals; Material Properties	<i>Material Properties</i> <i>Adding Decals</i> Work on Final Project
Final May 10	Final Project Presentations 4:30pm – 6:30pm	Presentation of Final Projects (5 min. max)