Objective
This course will introduce you to one of the CAD tools widely used in industry today. The tool will be SolidWorks 2013. 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.

Concepts
The concepts of this course will be 3D design for mechanical systems which include sketching, solid body construction, surfacing, creating assemblies using parts, machining processes, technical drawings, and presentation rendering.

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

Instructor
Raymond Kim
Contacting the Instructor
raymonmk@usc.edu
(213) 740-4542
Office Hours
TBD
Lab Assistants
TBD
Lecture
TBD
Lab
TBD
Required Textbooks
No Required Textbook, but mandatory account with SolidProfessor using USC email to sign up. Cost: $50 for 12 month subscription which includes course content.

Website
All course material will be on SolidProfessor (www.solidprofessor.com).

Grading
The following percentage breakdown will be used in determining the grade for the course.
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 at 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
The following shows the grading scale to be used to determine the letter grade.
93% and above  A
90% - 92%  A-
87% - 89%  B+
83% - 86%  B
80% - 82%  B-
77% - 79%  C+
73% - 76%  C
70% - 72%  C-
67% - 69%  D+
64% - 66%  D
63% and below  F

**Policies**

**Attendance and Drops**
It is the student’s responsibility to withdraw officially from a course.
Students are expected to attend all class meetings, and they must notify the instructor about absences due to illness prior to class. Student will be dropped from the class for excessive absences as well as for missing the first class meeting.

**Class Policies**
Students are expected to:
- Attend and participate in lecture discussions and critiques
- Attend and complete weekly labs and quizzes
- Manage and complete individual class projects

Students are responsible for completing assignments and projects by stated deadlines.

**Late Work**
Assignments and projects will be accepted for full 50% credit for up to one week after the due date. It is the responsibility of the student to contact the instructor when posting late projects.

**Computer Software and Labs**
Students will be required to complete assignments and projects using SolidWorks 2013. This software is available in the on-campus computer labs (http://www.usc.edu/its/spaces/computing_centers/index.html). In addition, students will be given copies of SolidWorks 2013 to use on their personal computers. Please be aware, however, that it is up to the student to ensure that they can properly connect to the license server either through a connection on campus, or through a VPN.

**Cell Phone / Distraction Policy**
Out of respect for all students, please turn off all phones or MP3 players and refrain from answering,
texting, checking email, or updating Facebook / Twitter / etc. during class.

**Syllabus / Course Changes**
This syllabus is a guideline so it is each student’s responsibility to note any changes that are made.

**Incomplete and Missing Grades**
Excerpts for this section have been taken from the University Grading Handbook, located at http://www.usc.edu/dept/ARR/grades/gradinghandbook/index.html. Please see the link for more details on this and any other grading concerns.

A grade of Missing Grade (MG) “should only be assigned in unique or unusual situations... for those cases in which a student does not complete work for the course before the semester ends. All missing grades must be resolved by the instructor through the Correction of Grade Process. One calendar year is allowed to resolve a MG. If an MG is not resolved [within] one year the grade is changed to [Unofficial Withdrawal] UW and will be calculated into the grade point average a zero grade points.

A grade of Incomplete (IN) “is assigned when work is no completed because of documented illness or other ‘emergency’ occurring after the twelfth week of the semester (or 12th week equivalency for any course scheduled for less than 15 weeks).”
**Academic Integrity**

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one’s own academic work from misuse by others as well as to avoid using another’s work as one’s own. All students are expected to understand and abide by these principles. Scampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: [http://www.usc.edu/dept/publications/SCAMPUS/gov/](http://www.usc.edu/dept/publications/SCAMPUS/gov/). Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: [http://www.usc.edu/student-affairs/SJACS/](http://www.usc.edu/student-affairs/SJACS/).

**Students with Disabilities**

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to your course instructor (or TA) as early in the semester as possible. DSP is located in STU 301 and is open from 8:30am to 5:00pm, Monday through Friday. Website and contact information for DSP [http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html](http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html) (213) 740-0776 (Phone), (213) 740-6948 (TDD only), (213) 740-8216 (FAX) ability@usc.edu

**Emergency Preparedness/Course Continuity in a Crisis**

In case of emergency, when travel to campus is difficult, if not impossible, USC executive leadership will announce a digital way for instructors to teach students in their residence halls or homes using a combination of the Blackboard LMS (Learning Management System), teleconferencing, and other technologies. Instructors should be prepared to assign students a “Plan B” project that can be completed ‘at a distance.’ For additional information about maintaining your classes in an emergency, please access: [http://cst.usc.edu/services/emergencyprep.html](http://cst.usc.edu/services/emergencyprep.html)
Computer-Aided Design for Bio-Mechanical Design
ITP 499 (3 Units)

Course Outline
Note: Schedule subject to change

Week 1 – Introduction to SolidWorks
- SolidWorks Interface
- Sketches
- Parts
Reading
SolidWorks 101: Lesson 1,2,3
Assignment/Lab
Assignment 1: Sketching

Week 2 – Advanced Parts
- Extrusions
- Boss/Bass
- Sweeps
- Patterns
- Ribs/Shells
- Chamfer
- Planes
Reading
SolidWorks 101: Lesson 4
Assignment/Lab
Assignment 2: Part Creation

Week 3 – Assemblies
- Assemblies
- Assembly features
Reading
SolidWorks 101: Lesson 5
Core Concepts: Assemblies
Assignment/Lab
Assignment 3: Advanced Part Creation

Week 4 – Drawings
- Drawings
- Section Views
- Annotations
- Bill of Materials
Reading
Drawings

Assignment/Lab
Assignment 4: Assemblies

Week 5 – Advanced Parts II
- 3D Sketching
- Derived Sketching
- Auto Trace

Reading
Advanced Parts: Advanced Sketching

Assignment/Lab
Assignment 5: Assembly Drawings

Week 6 – Advanced Parts III
- Lofts
- Boundary
- Dome
- Wrap
- Sweeps

Reading
Advanced Parts: Sweeps, Lofts, Dome and Wrap, Boundary

Assignment/Lab
Assignment 6: Advanced Part Creation II

Week 7 – CSWA
- CSWA

Reading
SolidWorks 101: Lesson 7

Assignment/Lab
Assignment 7: Advanced Part Creation III

Week 8 – CSWA
- CSWA

Reading
SolidWorks 101: Lesson 8, 9, 10

Assignment/Lab
Study for CSWA Test

Week 9 – Midterm/CSWA Test

Week 10 – SimulationXpress
- Strength of Materials
- Simulation of Loads
- Factor of Safety
Reading
SolidWorks 101: SimulationXpress

Assignment/Lab
Assignment 8: Simple Simulation

Week 11 – Surfacing
- Surfaces

Reading
Surfacing Essentials

Assignment/Lab
Assignment 9: Surfaces

Week 12 – Advanced Assemblies
- Assembly Features
- Component Patterns
- Advanced Mates

Reading
Advanced Assemblies: Assembly Features, Component Patterns, Advanced Mate Types

Assignment/Lab
Assignment 10: Advanced Assembly

Week 13 – Rendering and Appearances
- Scenes
- Lights
- Cameras

Reading
Visualization and Appearances

Assignment/Lab
Work on Final Project

Week 14 – Motion Study
- Motion and Animation

Reading
Workshop – Motion and Animation

Assignment/Lab
Work on Final Project

Week 15 – Final Project
- No New Material

Reading
None

Assignment/Lab
Work on Final Project

Final Project Presentation
- Presentation of Final Projects
- Presentations will be 5 min in length
Date, Time, and Place
According to the final exam schedule on the Schedule of Classes