

USC Viterbi

School of Engineering
*Information
Technology Program*

ITP 308 – Computer-Aided Design for Bio-Mechanical Systems

Units: 3

Spring 2018 – Monday – 5:00pm-7:50pm

Instructor: Raymond Kim

Office: OHE 530G

Office Hours: TBD

Contact Info: raymonmk@usc.edu

Teaching Assistant: TBD

Office: TBD

Office Hours: TBD

Contact Info: TBD

IT Help: Provided by Viterbi IT

Hours of Service: 8am–5pm M-F

Walk-in: DRB 205

Contact Info: (213) 740-0517

Email: engrhelp@usc.edu

Course Description

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

Learning Objectives

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, preparing students for the Certified SolidWorks Associate Develop certification.

Prerequisite(s): None

Co-Requisite(s): None

Concurrent Enrollment: None

Recommended Preparation: MATH 245 and some strength of materials knowledge.

Course Notes

All lecture slides and course content including homework and lab assignments will be posted to the course Blackboard page. Videos require a SolidProfessor account.

Technological Proficiency and Hardware/Software Required

Students are expected to be able to perform the following tasks before the course begins:

- **Create a ZIP file that contains one or more files**
- **UnZIP a file that contains one or more files**
- **Submit files through Blackboard's submission page**

Grading Breakdown

You will be graded on the following

ITEM	% of Grade
Lab Assignments	30
Homework Assignments	20
Midterm Exam	20
Final Project	30
TOTAL	100

Grading Scale

Course final grades will be determined using the following scale

A	93+
A-	90 - <93
B+	87 - <90
B	83 - <87
B-	80 - <83
C+	77 - <80
C	73 - <77
C-	70 - <73
D+	67 - <70
D	63 - <67
D-	60 - <63
F	<60

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:

A group of up to 3 students will create an assembly of their choice. The assembly must feature at least 4 different parts/students, with at least 8 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.).

Each group must submit a proposal that outlines their 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.

Each group will create a photo-realistic render of the assembly and create an animation of the assembly. Final projects will be presented during the assigned final time, including a discussion of the design process along with any trade studies that were conducted.

Anonymous peer evaluations will be submitted as well as evaluations of your project made by the other groups. Each will be taken into consideration when calculating the final project grade.

Total points: 100

20 Points – Proposal

20 Points – Presentation

50 Points – Assembly and Part Files

10 points – Evaluations

Assignment Submission Policy

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.

Grading Timeline

Grading of labs will be done by the end of the week on which the lab was assigned.

Grading of homework will be done within one week of the deadline.

Course Schedule: A Weekly Breakdown

	Topics/Daily Activities	Readings	Labs/Homework
Week 1	SolidWorks interface; sketches; parts; extrusions; boss/bass; sweeps	SolidWorks 101: Lessons 1-3	Lab1: Sketching Assignment 1: Sketching
Week 2	NO CLASSS	SolidWorks 101: Lesson 4	Lab2: Simple Parts Assignment 2: Basic Parts Assignment 1 Due
Week 3	Patterns; ribs/shells; chamfer; planes; assemblies; assembly features	SolidWorks 101: Lesson 5 Core Concepts: Assemblies	Lab3: Basic Assembly Assignment 3: Advanced Parts Assignment 2 Due
Week 4	Drawings; section views; annotations; BOM	Drawings	Lab4: Advanced Assemblies Assignment 4: Assemblies Assignment 3 Due
Week 5	3D sketching; derived sketches; auto trace	Advanced Parts: Advanced Sketching	Lab 5: 3D Sketching Assignment 5: Assembly Drawings Assignment 4 Due
Week 6	Lofts; boundary; dome; wrap; sweeps	Advanced Parts: Sweeps, Lofts, Dome and Wrap, Boundary	Lab6: Bowling Pin Assignment 6: Advanced Part Creation II Assignment 5 Due
Week 7	NO CLASS	SolidWorks 101: Lesson 7	Lab7: Sample CSWA Part Assignment 7: Advanced Part Creation III Assignment 6 Due Proposal Due
Week 8	CSWA: Parts; CSWA Assemblies	SolidWorks 101: Lesson 8 – 10	Lab8: Sample CSWA Assignment 7 Due
Week 9	MIDTERM		
Week 10	Simulation Xpress; simulation of loads; FOS	SolidWorks 101: SimulationXpress	Lab9: Generating Reports Assignment 8: Strength of Materials
Week 11	Surfaces	Surfacing Essentials	Lab10: Simple Surface Parts Assignment 9: Helmet Assignment 8 Due
Week 12	Assembly features; component patters; advanced mates	Advanced Assemblies: Assembly Features, Component Patterns, Advanced Mate Types	Assignment 10: Engine assembly Assignment 9 Due
Week 13	Scenes; lights; cameras	Visualization and Apperances	Work on Final Project Assignment 10 Due
Week 14	Motion and animation	Workshop: Motion and Animation	Work on Final Project
Week 15	Decals; material properties	Material Properties, Adding Decals, Giving a concise, useful, technical Talk	Work on Final Project
FINAL			Date: For the date and time of the final for this class, consult the USC

			Schedule of Classes at www.usc.edu/soc .
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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 Part B, Section 11, “Behavior Violating University Standards”

<https://policy.usc.edu/scampus-part-b/>. 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>

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, the instructors 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.

Support Systems:

Student Counseling Services (SCS) - (213) 740-7711 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. <https://engemannshc.usc.edu/counseling/>

National Suicide Prevention Lifeline - 1-800-273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. <http://www.suicidepreventionlifeline.org>

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 - 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. <https://engemannshc.usc.edu/rsvp/>

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: <http://sarc.usc.edu/>

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086

Works with faculty, staff, visitors, applicants, and students around issues of protected class. <https://equity.usc.edu/>

Bias Assessment Response and Support

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. <https://studentaffairs.usc.edu/bias-assessment-response-support/>

The Office of Disability Services and Programs

Provides certification for students with disabilities and helps arrange relevant accommodations.

<http://dsp.usc.edu>

Student Support and Advocacy – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic <https://studentaffairs.usc.edu/ssa/>

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. <https://diversity.usc.edu/>

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible, <http://emergency.usc.edu>

USC Department of Public Safety – 213-740-4321 (UPC) and 323-442-1000 (HSC) for 24-hour emergency assistance or to report a crime.

Provides overall safety to USC community. <http://dps.usc.edu>