

USC Viterbi

School of Engineering
*Information
Technology Program*

ITP 228 – Computer-Aided Modeling for 3D Product Design

Units: 2

Fall 2019—Tuesday/Thursday—2:00pm – 3:20pm

Location: KAP 166

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

In this course, students will learn the fundamentals of 3D modeling. The course focuses on being able to think, plan, and create in three dimensional space using extrusions, surfaces, and equation driven curves drawn in two dimensional sketches. Emphasis is put on design for 3D printing technologies for rapid prototyping of models.

Required Online Subscription

This course will make use of online tutorial videos designed to enhance student learning. Online videos are part of a subscription that lasts for one full calendar year.

To sign up, please visit:

<https://app.solidprofessor.com/iframes/studentstore.asp>

Learning Objectives

Students will be able to manipulate and create objects in three dimensions using 2D sketches, surfaces, extrusions, cuts, and lofts. Students will demonstrate ability to produce models and convert them to printable file formats. Students will demonstrate ability to design models for ease of manufacturing using 3D printing methods.

Format

This course will make use of Blackboard for content and assignments. Lecture slides and any supplemental course content will be posted to Blackboard for use by all students. Any and all announcements for the course will be posted to Blackboard. All assignments will be posted to Blackboard and will be submitted through Blackboard. **Please familiarize yourself with Blackboard before the course begins.**

Assignments

Students will be given assignments to be completed outside of class. Assignments will consist of a model, or set of models to be completed and turned in to Blackboard.

Final Project

Students will be tasked with a final product to be printed. The final project will be to design, model, and print a system/object of the student's choosing. The project must contain no less than 5 different parts and must be approved by the instructor for complexity and difficulty. The final project is graded on the following:

- 15% - Proposal
- 40% - Modeling
- 30% - Final Printed Prototype
- 15% - Presentation

Students must submit a proposal for approval by the instructor. Once the proposal has been approved, students may begin working on their project. If the proposal is not approved, students must resubmit a new proposal or idea.

Students will be required to do a short (~10 minute) presentation on their product. They must discuss the design, modeling, and printing processes.

Grading Breakdown

Assignment	% of Grade	
Homework 1	10	
Homework 2	15	
Homework 3	15	
Homework 4	20	
Final Project	40	
TOTAL	100	

Grading Scale

Course final grades will be determined using the following scale

A	93-100
A-	90-92.99
B+	87-89.99
B	83-86.99
B-	80-82.99
C+	77-79.99
C	73-76.99
C-	70-72.99
D+	67-69.99
D	63-66.99
D-	60-62.99
F	59 and below

Assignment Submission Policy

All assignments are to be submitted through Blackboard.

Grading Timeline

Grading shall be completed no later than one week after due date.

Late Work

No late work will be accepted.

Course Schedule: A Weekly Breakdown

	Topics/Daily Activities	Readings	Homework	Deliverable
Week 1	Working in 3D space Changing views Basic Sketching	SP Week 1 Videos		
Week 2	Sketch relationships and constraints 3D Printing Technologies	SP Week 2 Videos	Homework 1: Basic Sketching	
Week 3	Creating 3D Parts: Extrusions Creating 3D Parts: Cutting	SP Week 3 Videos	Homework 2: Basic Parts	Homework 1 Due
Week 4	Creating 3D Parts: Sweeps Creating 3D Parts: Revolves	SP Week 4 Videos		
Week 5	Working with complex geometry: Lofts	SP Week 5 Videos		
Week 6	Working with complex geometry: Surfaces	SP Week 6 Videos	Homework 3: Advanced Parts	Homework 2 Due
Week 7	Putting it all together: Assemblies	SP Week 7 Videos		Proposal Due
Week 8	Understanding how it fits together: Motion	SP Week 8 Videos		
Week 9	3D Printing Material Selection			
Week 10	3D Printing considerations: Building enclosures and mechanical parts		Homework 4: Building Enclosures	Homework 3 Due
Week 11	3D Printing Basics: The Build Plate			
Week 12	3D Printing Basics: Organizing Prints Overhangs			
Week 13	Print Parameters Print Speed and Layer Height			
Week 14	Infill: Weight vs. Structure Supports			Homework 4 Due
Week 15	Advanced Topics in 3D Printing			
FINAL				Final Project Due Final Presentation

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>

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>