

## **E 128 - Advanced Engineering Graphical Communication, Fall Semester 2018**

**Instructor:** Prof. D.K. Lieu email: [dlieu@me.berkeley.edu](mailto:dlieu@me.berkeley.edu)  
5128 Etcheverry Hall  
642-4014  
Office Hours: MW 10-12 AM

**GSI/Readers:** TBA email: TBA  
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TBA  
Office Hours TBA

### **Description:**

Advanced 3-dimensional graphics tools for engineering design. Parametric solids modeling: parts modeling using constructive solids, sweeps, rotation, Boolean operations, and feature based modeling. Assembly modeling and creation of working drawings. Computer rendering, viewing, and presentation of solids. Technical presentation using computer animation and multimedia techniques. A design project is required. E26, or equivalent, is required for this course. 3 units.

Lectures: TuTh 12:30 – 2, 10 Jacobs Hall (CAD Lab)  
Laboratory: Th 6:30-9:30 PM, 10 Jacobs Hall (CAD Lab)

### **Recommended Textbooks:**

*3DS Max 2019 Complete Reference Guide*, Kelly Murdock, ISBN: 978-1-63057-180-1, SDC Publications

*Creo Parametric 5.0 Tutorial*, R. Toogood, ISBN: 978-1-63057-207-5, SDC Publications

### **Organization:**

14 weeks of lecture. Open laboratories. Weekly or bi-weekly homework assignments. One group design project. To find E128 final projects from previous years, go to <http://www.youtube.com>. Search for *E128 project*.

### **Laboratory:**

Laboratories begin the second week of class. The laboratories have an "open" format. After your enrollment is confirmed, attendance in laboratory sections is required for at least one hour during the scheduled time. The purpose of the laboratory sections is to provide a forum where students can discuss, and receive assistance with, lecture and homework material with the instructor, GSI, and other students. Although laboratory attendance is not required for the entire session, it is highly recommended.

### **Facilities:**

The building and laboratories are locked from 6:00 PM – 7:00 AM and on weekends; however, students enrolled in the class can access the building and labs with a card key. Card activation will be through Dan Essley in room 6161 Etcheverry Hall.

The 45 CAD workstations in the Jacobs Hall CAD Lab are provided for student use in this course. The stations are networked to a fileserver and there is a printer in the room. Each student will receive approximately 4 Gb of file

storage space on the fileserver. Each student is required to have a min. 2 Gb USB drive, for file transfer and back-up. In addition, there will be desk space and power outlets for students to use their own laptop computers instead of the provided workstations, if desired. Most homework assignments will require the use of a computer with the course software. You are required to have a back-up copy of all your homework assignments, dated on or before their due dates. The software used for this course will be PTC Creo Parametric 5.0 (formerly Pro/Engineer), and Autodesk 3D Studio Max 2018.

If problems are encountered with a machine, place a note under the keyboard describing the problem, and move to another machine, otherwise the instructors have no way of knowing that a machine is down. Keep the room secure. Do not allow unauthorized access. Please notify one of the instructors or campus security of any suspicious persons or events in, or near, the design laboratory.

\*\*\*\*\* **WARNINGS** \*\*\*\*\*

FOOD AND DRINK ARE NOT PERMITTED INSIDE THE LABORATORIES.

DO NOT PROVIDE ROOM ACCESS OR MACHINE ACCESS TO ANYONE NOT ENROLLED IN THE COURSE.

DO NOT MAKE COPIES OF THE SOFTWARE OR MANUALS, NOT EVEN FOR PERSONAL USE. THIS IS ILLEGAL.

DO NOT INSTALL ANY SOFTWARE NOT LICENSED FOR USE ON ANY OF THE MACHINES. THIS IS ILLEGAL.

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**Scoring:**           60% Homework  
                          40% Final Project

## Engineering 128, Spring Fall 2018

<u>Week</u>	<u>Dates</u>	<u>Material</u>
1	8/23	Class introduction, attendance, computer accounts. The file system.
2	8/28, 8/30	<b>Solid Part Modeling.</b> The user interface: The desktop, moving and viewing in 3D, interrogating models. Sketcher mode and tools. Creating geometry and constraints. Construction geometry. Soft and hard dimensions.
3	9/4, 9/6	Extrusion and rotation to create solids. Creating features. Shelling.
4	9/11, 9/13	Using reference geometry. Parent/Child relationships. Sweeps and Blends. Sweep trajectories and parallel blends.
5	9/18, 9/20	Parametric relations and parameters . Duplicating features. Copy and mirror. Arrays. Part families.
6	9/25, 9/27	<b>Project Organization.</b> Formation of project teams. <b>Technical Animation.</b> Animator user interface, moving and viewing in 3D, visibility and shading options. 2-D shaping with vertices. Translation, rotation, and scaling.
7	10/2, 10/4	Working with 3D primitives. Boolean operations. Importing of 3D files. 3-D surface generation with lofting. Translation, rotation, and scaling. Duplication of objects.
8	10/9, 10/11	Editing of complex 3-D models. Scale, Twist, Teeter, and Fit Operations. 3D Loft Paths. Importing and exporting model files.
9	10/16, 10/18	The Material Editor. Rendering. Stock materials. Custom materials. Composite materials and Decaling. Creating backgrounds and scenes. Lighting. Camera views.
10	10/23, 10/25	Animation. Key Frames. Motion of parts. Lights, and cameras. Tension, continuity, and bias (TCB), and other controllers. Morphing of geometry and materials
11	10/30, 11/1	Parent-Child relationships of joined parts. Inverse kinematics. <b>Project Reviews.</b>
12	11/6, 11/8	Special effects. Audio files. Exporting of animation files. <b>Assembly Modeling.</b> The surface normal vector. Assembly constraints.
13	11/13, 11/15	<b>Technical Documentation.</b> Working drawings, standard and supplementary views. Dimensioning and tolerancing, GD&T
14	11/20*	Dimensioning and tolerancing, GD&T
15	11/27, 11/29	Focus on Projects. Review.

\*Notes:                    3 September is an academic holiday. No classes  
                                   22-23 November is the Thanksgiving holiday. No class, no Lab.