

## MECHANICAL ENGINEERING 165

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**Course:** ME 165-01 – Computer Aided Design in Mechanical Engineering  
**Semester:** Spring 2016  
**Credit Units:** 3  
**Class Code:** 29412  
**Meeting Times:** MoWe 7:30pm – 8:45pm, Clark 117 (Lecture), Engineering 213 (Lab)  
January 28, 2016 – May 16, 2016  
**Instructor:** Michael Signorelli  
**Email:** Michael.P.Signorelli@gmail.com  
**Website:** <http://sjsu.instructure.com/>  
**Office Hours:** TBD

### COURSE DESCRIPTION

The purpose of this course is to provide students an introduction to computer aided design (CAD), geometric modeling and computer graphics; more specifically, to introduce theory and application of lines, curves, surfaces and solid models. Topics covered include analytical and approximation methods of generating wireframes, surfaces and solid models. Commercial CAD software is introduced and applied to create engineering components and assemblies.

**Textbook:** Toogood, R.; Zecher, J. Creo Parametric 2.0 Tutorial. SDC Publications.

**Software:** PTC Creo Parametric 2.0

**Prerequisites:** ME 20; CE 112; and ME 130 or ME 129A, with a grade of C- or better

**Homework:** Homework will be assigned throughout the semester and will be due approximately one week after it is assigned. Homework can have both theoretical and practical portions. Homework is to be submitted to Canvas by 11:59pm on the day it is due (unless otherwise noted). No credit will be given for late homework.

**Presentation:** Students will form groups and give a presentation about an intermediate CAD topic. Groups will be required to pick a topic and give a short presentation on Wednesday April 21, 2016. These topics will generate questions for the final.

**Project:** Students will be required to partake in a group project. More details will be given in class. Final reports will be due on Wednesday, May 18, 2016.

**Examinations:** Lab Quiz: Wednesday, March 10, 2016  
Midterm: Wednesday, March 24, 2016  
**Final Exam: Wednesday, May 18, 2016 7:45pm – 10:00pm**

<b>Grading:</b>	Homework/Labs	15%
	Lab Quiz	15%
	Midterm	15%
	Presentation	5%
	Project	20%
	Final Exam	30%

**Grading Rules:** Standard grading rules apply:

$90\% \leq A- \leq 93\% < A \leq 97\% < A+ \leq 100\%$

$80\% \leq B- \leq 83\% < B \leq 87\% < B+ < 90\%$

$70\% \leq C- \leq 73\% < C \leq 77\% < C+ < 80\%$

$60\% \leq D- \leq 63\% < D \leq 67\% < D+ < 70\%$

$F < 60\%$

### **COURSE GOALS**

1. To learn the basic concepts of wireframe, surface and solid modeling
2. To learn the application of commercially available solid modeling software
3. To develop a basic theoretical understanding of how CAD models are created

### **STUDENT LEARNING OBJECTIVES**

1. Students will know the history and role of CAD in the practice of mechanical engineering
2. Students will know the basic requirements of software and hardware for using a CAD package
3. Students will have a basic theoretical understanding of and practical application of finite element analysis and model optimization
4. Students will have the ability to use Creo software
5. Students will become proficient in creating CAD models for engineering parts, drawings and assemblies

### **COURSE WEBSITE**

All course announcements will be posted on the course website. This course will use Canvas so make sure you are able to login and access the course page. Please contact me if there are any issues with the website as soon as possible. All lecture notes and assignments will be available for personal use and download but this should not be substitute for class attendance.

The course website has a discussion board and I highly recommend posting to it if you have any questions or concerns. Students are encouraged to interact with one another in regards to any course-related issue—please do not post any solutions. I reserve the right to monitor the discussion boards throughout the semester.

### **HOMEWORK/LAB SUBMISSIONS**

Homework and lab assignments will be submitted online approximately one week after they are assigned. The format for these submissions can be found on the course website.

### **DEPARTMENT POLICY ON COMPUTER LAB USE**

“Use of the department and college computer labs is a privilege that can be lost by abuse. The following are grounds for loss of lab privileges:

- Unauthorized copying of software, either from the computer, or using the computer.
- Installation of any software, media or files that are not specifically required to do your class activities. You may not install messenger, music, gaming or any other software programs on the computer in the lab.
- Abuse of computer or hacking or modifying the operating system, user interface or desktop in any way.”

### **ACADEMIC INTEGRITY POLICY**

“The University emphasizes responsible citizenship and an awareness of ethical choices inherent in human development. Academic honesty and fairness foster ethical standards for all those who depend upon the integrity of the university, its courses, and its degrees. University degrees are compromised and the public is defrauded if faculty members or students knowingly or unwittingly allow dishonest acts to be rewarded academically.”

Students and Faculty are subject to the current Academic Integrity Policy, located at:  
[http://www.sjsu.edu/senate/policies/pol\\_plagarism\\_acad\\_integrity/](http://www.sjsu.edu/senate/policies/pol_plagarism_acad_integrity/)

## COURSE SCHEDULE

Week No.	Monday	Wednesday
Week 1 (2/1 – 2/5)	Introduction. CAD Overview.	(Lab) Creo Overview. Sketcher. Extrusions.
Week 2 (2/8 – 2/12)	Geometric Transformations. <b>Hwk #1 due.</b>	(Lab) Extrusions. Revolutions. Simple Features.
Week 3 (2/15 – 2/19)	Three-dimensional Transformations.	(Lab) References. Datums. <b>Lab #1 due Friday.</b>
Week 4 (2/22 – 2/26)	(Lab) Modeling Utilities. <b>Hwk #2 due.</b>	(Lab) Parametric Design. Design Intent.
Week 5 (2/29 – 3/4)	Geometry of Curves.	(Lab) Sweeps and Blends. <b>Lab #2 due Friday.</b>
Week 6 (3/7 – 3-11)	(Lab) Advanced Blends.	<b>Lab Quiz: Solid Modeling</b>
Week 7 (3/14 – 3/18)	Geometric Dimensioning and Tolerancing.	Geometric Dimensioning and Tolerancing., cont. <b>Lab #3 due Friday.</b>
Week 8 (3/21 – 3/25)	(Lab) Part/Engineering Drawings. <b>GD&amp;T Worksheet due.</b>	<b>Midterm</b>
<b>Spring Recess (3/28 – 4/1)</b>	<b>Spring Recess, No Class.</b>	<b>Spring Recess, No Class.</b>
Week 9 (4/4 – 4/8)	(Lab) Assemblies.	(Lab) Assemblies, cont.
Week 10 (4/11 – 4/15)	Introduction to Finite Element Analysis.	(Lab) Finite Element Analysis. <b>Lab #4 due Friday.</b>
Week 11 (4/18 – 4/22)	(Lab) Finite Element Analysis, cont.	<b>Intermediate Topic Presentations</b>
Week 12 (4/25 – 4/29)	<b>No class.</b>	<b>No class.</b> <b>Lab #5 due Friday.</b> <b>Progress Report due Friday.</b>
Week 13 (5/2 – 5/6)	(Lab) Optimization.	(Lab) Optimization, cont.
Week 14 (5/9 – 5/13)	(Lab) Mechanisms.	(Lab) Mechanisms, cont. <b>Lab #6 due Friday.</b>
Week 15 (5/16 – 5/20)	<b>Final - Theory</b>	<b>Final - Practical</b>

\* Course Schedule is subject to change with fair notice.