UNIVERSITY OF CALIFORNIA
MERCED

Syllabus

ME 137: Computer Aided Engineering

Fall 2018
Instructor: Ala Qattawi

Taught as a blend of online and face-to-face instruction

Designation: ME-137: Computer Aided Engineering

Number of Units 3

Expected Workload This course is worth 3 units of credit. Consistent with UC Merced's *credit hour policy*, you should expect to work an average of 9 hours per week on ME 137 this semester to achieve the learning outcomes and earn a passing grade in this course. You will spend 3 of these hours viewing/attending/studying the weekly online lecture and class discussion board, with the remaining 6 hours allotted to weekly practicing and check for understanding quizzes, recorded video lectures, weekly problem practice, weekly homework assignments, case studies and projects. Some weeks may require more work and others less, but on average please plan to devote 9 hours per week to your success in ME 137.

Catalog Description: Introduction to the use of modern computational tools used for design and analysis. Primary focus is on product design with solid modeling and finite-element analysis. Software used is representative of that found in industry. Topics such as 2-D and 3-D drawing, tolerance specification, and FEA validation are also covered.

Text Books and Other Required Materials: Fundamentals of Graphics Communication / Edition 6. ISBN-13: 9780073522630
SolidWorks 2018 for Designers, CADCIM Technologies; ISBN-13: 978-1936646814

USB Memory Stick 2GB minimum

Software SolidWorks 2017-2018 (Provided by School of Engineering: ME 137 students will be able to download a license of software on their personal devices
(Installation info is available on Catcourse files folder)

Currently, there is no available version of the software for MAC operating system

Course Objectives/ Student Learning Outcomes:

After successful completion of this class, the students will be able to:

1. Construct 3-D solid models, 2-D drawings, and assembly and sub-assembly structures.
2. Generate 2-D and 3-D models for finite element analysis.
3. Apply mathematical skills in the design and analysis of model generations and analysis.
4. Analyze, verify and interpret Finite –Element Analysis (FEA) results.
5. Follow design procedures including problem identification, data collection, problem formulation, approaches, methodology, and solution.
6. Use industry-standard software packages and analytical tools.
7. Performa a prototyping of final project using 3D printers to demonstrate the student's design manufacturability/feasibility.

These abilities will be demonstrated in homework problems, design case evaluation, and projects. As well as through active participation in a multiple student design team in the course project.

Program Learning Outcomes:

ABET Learning Outcomes:

- Apply mathematical skills in the design and analysis of model generations and analysis
- Exercise analytical skills in model verifications and interpretations of FEA results
- Apply knowledge from component design in projects
- Through required design procedures, students are required to take proper steps that include problem identification, data collection, problem formulation, approaches, methodology, and solution
- Students are reminded of social and environmental impacts by their designs and engineering decision
- Reports and presentations of design projects as well as emphasis on effective personal communication between group members
- Industry-standard software packages and analytical tools are used intensively in design project
- Knowledge of strength of materials is used in projects
- Creativity is emphasized. Students are encouraged to meet the design challenges with out-of-the-box thinking.
- Experience gained in this course prepares the students for capstone design course

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Prerequisites by Topic:

ME-120 Component Design
ENGR 45 Introduction to Materials
ENGR 57 Statics & Dynamics

Academic Dishonesty Statement:

Each student in this course is expected to abide by the University of California, Merced's Academic Honesty Policy. Any work submitted

by a student in this course for academic credit will be the student's own work.

Disability Statement: Accommodations for Students with Disabilities: The University of California Merced is committed to ensuring equal academic opportunities and inclusion for students with disabilities based on the principles of independent living, accessible universal design and diversity. I am available to discuss appropriate academic accommodations that may be required for student with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances. Students are encouraged to register with Disability Services Center to verify their eligibility for appropriate accommodations.

Topics:

- Introduction to solid modeling.
- Concepts of 3-D modeling.
- Model structure. Engineering drawing.
- Fundamentals of assembly and sub-assembly.
- Parametric modeling.
- Advanced feature-based design.
- Fundamentals of modeling for finite element analysis.
- Analysis methods.
- Design creativity.
- Design for manufacturability.
- Real-world problems: critiques, analysis, and improvements.

Class Schedule: ***Lectures:*** all lectures will be available online on Canvas system. The lecture's videos are not live and are previously recorded. Each week videos will be available on Monday morning every week in addition to the weekly assignment. Assignments are due on the following Monday by 8 am.
Location: Lectures will be available on Catcourse: Kaltura Media Gallery Tab on Catcourse

Laboratory Schedule: Every Monday & Wednesdays
MW 1:30-4:20 PM ***SSM 154*** TA: Ghazaale Leylaz Mehrabadi
MW 4:30-7:20 PM ***SSM 154*** TA: Li, Haoyu
Lab attendance is mandatory. Unsatisfactory lab attendance will result in an F grade

Practicing Labs: Free computer labs will have the software and are open access any time to students:
Location: **SSM 152**

Professional Component	Engineering fundamental 25% Engineering applications 75%

Assessment

- Weekly Assignment/ Homework/Quizzes/In-Lab HW 40%
- Exams 30%
- Projects & Case Studies 20%
- Prototyping Final Project (3D printing) 10%

Grading Policy

- 98-100 A+
- 94–97 A
- 90-93 A-
- 87-89 B+
- 84-86 B
- 80-83 B-
- 77-79 C+
- 74-76 C
- 70-73 C-
- 65-69 D
- Below 65 F

Grade points are assigned as follows: A+ = 4.0, A =4.0, A-= 3.7, B+ = 3.3, B = 3.0, B- = 2.7, C+ = 2.3, C = 2.0, C- =1.7, D+ = 1.3, D = 1.0, D-= 0.7, F = 0.0.
UC Merced Grading policy :
http://catalog.ucmerced.edu/content.php?catoid=6&navoid=487#Grades

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Contact Information: ***Instructor:*** Dr. Ala Qattawi
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Email: aqattawi@ucmerced.edu
Make sure email's title starts with "ME137: otherwise will go to spam.

TA1: Ghazaale Leylaz Mehrabadi
Office Hours: Check Catcourse.
Email: gleylaz@ucmerced.edu

TA2: Haoyu Li
Office Hours: Check Catcourse.
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Course Calendar: Located on Catcourse (subjected to change)

This is a hybrid online course; most of the communications will be through Catcourse. It is the students' responsibility to check their emails and Catcourse announcements regularly