



Department of Mechanical Engineering
ME EN 4010 – Engineering Design II – Fall 2016

Syllabus

Instructor:	Prof. B. Raeymaekers , MEK 2677, bart.raeymaekers@utah.edu
Office Hours:	M/W 11:35-12:00 pm, (MEK 2677) + when my office door is open
Units:	3
Meeting Times:	M, W, F: 10:45 am -11:35 am, WEB L120 (see detailed schedule in Table)
Engineering Lab:	CADE Lab and Engman Lab
Text:	Product Design and Development, Karl Ulrich and Steven Eppinger, McGraw-Hill, 5th Edition (or can use 4rd Edition)
Course Website:	Hosted on CANVAS
Pre-requisites:	ME EN 3000, 4000, and Upper Division ME Status
Course TA:	Michael Price (michael.r.price@utah.edu)

Course summary:

ME EN 4010 is the final course in the Senior Design Sequence - ME EN 3000, 4000, 4010. The course is a team project-based course, in which teams of engineering students complete an engineering design project from start to finish.

Course objectives:

At the end of this course the student will be able to apply design methodology to define, design, analyze, manufacture, evaluate, and document an engineered product. To do this the student will:

1. Learn the design process and apply it to team projects.
2. Learn to effectively define, plan, and document a project and communicate its outcomes.
3. Work closely with a team advisor to develop an engineered product.
4. Learn to effectively manage project resources (budget, project schedule, man power).

Grading:

Grades will be based on the standard >90% = A, 80-90% = B, 70-80% = C, 60-70% = D, and <60% = E.

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|---------------------------------------|-----|-------------|
| • Team Homework | 5% | |
| • 3 Design Reviews (each) | 10% | (30% total) |
| • Design Day Demonstration and Poster | 25% | |
| • Design Project / Final Report | 40% | |

Each item must be completed to pass the course.

Deliverables:**Team Homework (5%)**

You will have four team homework assignments.

- **Project Milestones Document (100 pts): Due on Fri August 26 at 5pm on Canvas**

Your first assignment of the semester will be to produce a document outlining your project plan. This document should clearly list all milestones that need to be reached, with dates, to accomplish a successful project by Design Day on December 1. At each design review you will be expected to report on your status in meeting these milestones. You will be expected to have met milestones that have passed at the time of the design review and have clear plans to reach the upcoming milestones.

- **Design Day Information Form and Images (50 pts): Due on Mo October 3 at 5pm on Canvas**

You will need to fill out the online Design Day information form and upload project images to be used for promotional material.

- **Project Poster Pre-submission: Due on Mo November 16 at 5pm on Canvas**
- **Project Poster: Due on Mo November 23 at 5pm on Canvas**

Design Reviews (10% each)

There will be three design reviews. See Table at the end of this document for the schedule. The design reviews are limited to 20 minutes and need to provide a brief update on the status of the project. This will include your progress on your milestones, technical aspects of the project that you are currently working on, any issues or adjustments to the project plan, and any foreseen risks. All team members are required to be present and answer questions in a professional and competent manner about all aspects of the project. Each team member is required to present in at least one design review. If problems in the planned design arise, team members are expected to provide approaches to solve the problems in their designs. Students that miss design reviews will receive a failing grade (0/10) for that Design Review.

Design Day (25%)

The final design project demonstration will take place on Design Day in the Union Ballroom. It is envisioned that this presentation will involve a live demonstration of the project (where applicable) or involve use of multimedia (videos, simulations, etc.). I will come by each team poster and demonstration at which time you should present your project to me. You will have 10 minutes to provide an overview of the project and highlight achievements. Specific demonstration of the critical functions of the device will be required. Design Day is open to the public.

Final Report (40%)

The final report will include all deliverables developed in ME EN 4000 and 4010. A summary of the requirements for the final report are found in the Introductory Lecture Notes.

Team Peer Evaluations

At the end of the semester you will fill out peer evaluation forms. As all assignments are team assignments, your individual grade will be scaled based on your individual contributions, which will be determined by the peer evaluations. Your individual grade can be increased or decreased up to one full letter grade (10 percentage points) based on individual contributions.

Schedule

The schedule is **preliminary and subject to change**. Changes to the published schedule will be announced on Canvas and emailed to affected teams. Lectures are highlighted in purple, Design Reviews in blue.

Week	Mon (10:45 - 11:35 AM) WEB L120	Wed (10:45 - 11:35 AM) WEB L120	Fri (10:45 - 11:35 AM) WEB L120
1	August 22 Class Introduction	August 24 Class Intro and Safety	August 26 No Class
2	August 29 No Class	August 31 No Class	September 2 DR 1: Teams 1, 2
3	September 5 Labor Day	September 7 DR 1: Teams 3, 4	September 9 DR 1: Teams 5, 6
4	September 12 DR 1: Teams 7, 8	September 14 DR 1: Team 9	September 16 DR 1 follow-up
5	September 19 No Class	September 21 No Class	September 23 No Class
6	September 26 DR 2: Teams 1, 2	September 28 DR 2: Teams 3, 4	September 30 DR 2: Teams 5, 6
7	October 3 DR 2: Teams 7, 8	October 5 No Class	October 7 No Class
8	October 10 Fall Break	October 12 Fall Break	October 14 Fall Break
9	October 17 DR 2: Team 9	October 19 No Class	October 21 No Class
10	October 24 No Class	October 26 No Class	October 28 No Class
11	October 31 Design Day Posters	November 2 DR 3: Teams 1, 2	November 4 DR 3: Teams 3, 4
12	November 7 DR 3: Teams 5, 6	November 9 DR 3: Teams 7, 8	November 11 DR 3: Teams 9
13	November 14 No Class	November 16 No Class	November 18 No Class
14	November 21 No Class	November 23 Design Day and Final Report	November 25 Thanksgiving Break
15	Design Day Thu December 1, 2016 from 9:00AM - 3:00PM		
16	Final report is due Wed December 7 by 11:59 PM. Turn it in to Canvas and to advisor.		

Team 1: Hydrogen fuel system (Advisors: Drs. Smith and Francoeur)

Team 2: Automated solar window blinds (Advisor: Drs. Smith and Leang)

Team 3: Wireless power for aerial robots (Advisors: Drs. Roundy and Leang)

Team 4: Solar car cooler (Advisor: Dr. Metzger)

Team 5: Pumpable ice (Advisor: Dr. DeVries)

Team 6: Vert buggy elevator (Advisor: Dr. DeVries)

Team 7: Fountain water flow dynamics study (Advisors: Drs. Pardyjak and Harris)

Team 8: Ping-pong ball shoot-o-matic (Advisor: Dr. Monson)

Team 9: NASA robotic miner (Advisor: Dr. Meek)

General Class Policies

1. Attendance: Failure to attend a Design Review will result in a score of zero for that Design Review. Failure to be present at Design Day will result in failing the class.
2. If the Instructor or Project Advisor determines that you have not significantly contributed to your team's project, the Instructor reserves the right to give a failing grade for the class.

Academic dishonesty policy: ME EN 4000 will strictly follow the standard academic policy outlined by the University and the College of Engineering.

Faculty and student responsibilities:

No laptops, cellular/smart phones are allowed during class meeting times. These can be disruptive and distracting to your class mates.

All students are expected to maintain professional behavior in the classroom setting, according to the Student Code, spelled out in the Student Handbook. Students have specific rights in the classroom as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, plagiarism, and/or collusion, as well as fraud, theft, etc. Students should read the Code carefully and know they are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible classroom behaviors, beginning with verbal warnings and progressing to dismissal from class and a failing grade. Students have the right to appeal such action to the Student Behavior Committee.

“Faculty...must strive in the classroom to maintain a climate conducive to thinking and learning.” PPM 8-12.3, B.

“Students have a right to support and assistance from the University in maintaining a climate conducive to thinking and learning.” PPM 8-10, II. A.

ADA statement: “The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations.” (www.hr.utah.edu/oeo/ada/guide/faculty/)