Course Description:
Design of mechanical equipment and systems using various machine elements and components such as screws, fasteners, shafts, gears, bearings, clutches, etc. Decision modeling based on technical and economic feasibility.

Course Objectives:
- Define design objectives and generate ideas and concepts for mechanical designs
- Apply engineering fundamentals to create mathematical models for the analysis and synthesis of designs.
- Select appropriate machine elements, components and materials for mechanical systems.
- Analyze and size selected machine components for appropriate strength, stiffness, and fatigue life.
- Integrate computer-aided design.

Week  Date  Topic  Reading  HW due  Lab (Thurs)
1  M 9/17  No class (Instructional Planning)  --  --  Teardown
   W 9/19  Introduction / Design Process  --  --  --
   F 9/21  Problem Definition  6.1-14 (review)  --  --
2  M 9/24  Concept Design  18.1-12 (skim)  --  --
   W 9/26  Power Sources / Quiz 1 (review)  handout A  HW 1  --
   F 9/28  Power Transmission (Gears, Belts, Chains)  13.1-5; 17.1,5  --  --
3  M 10/1  Gears / Quiz 2 (motors / review)  13.6-17  HW 2  --
   W 10/3  Gear Selection  14.1-19  --  --
   F 10/5  Gear Selection  --  --  --
4  M 10/8  Shafts / Quiz 3 (shafts)  7.1-4  HW 3  --
   W 10/10  Shaft Design  7.5-6  --  --
   F 10/12  Shaft Design  --  --  --
5  M 10/15  Shaft Design / Quiz 4 (shafts)  --  HW 4  --
   W 10/17  EXAM 1 (HW 1-4)  --  --  --
   F 10/19  Bearing Types  11.1-5; 12.1-5,15  --  --
6  M 10/22  Bearing Selection / Quiz 5 (bearings)  11.6,8-11  HW 5  --
   W 10/24  Bearing Selection  --  --  --
   F 10/26  Bearing Selection  --  --  --
7  M 10/29  Part Integration / Quiz 6 (bearings)  3.16; 7.7-8; 16.11  HW 6  --
   W 10/31  Belt Drives  17.1-3  --  --
   F 11/2  Chain Drives  17.5  --  --
8  M 11/5  Chain Drives  --  --  --
   W 11/7  Springs / Quiz 7 (belts/chains)  10.1-6  HW 7  --
   F 11/9  Springs  10.7-10  --  --
9  M 11/12  No class (Veteran’s Day)  --  --  --
   W 11/14  Review / Quiz 8 (springs)  --  HW 8  --
   F 11/16  EXAM 2 (HW 5-8)  --  --  --
10  M 11/19  Fasteners  8.1-5  --  --
   W 11/21  No class (Thanksgiving holiday)  --  --  No Lab
   F 11/23  No class (Thanksgiving holiday)  --  --  --
11  M 11/26  Fasteners  8.6-12  --  --
   W 11/28  Fasteners  --  --  --
   F 11/30  Wrap-up / Review / Quiz 9 (fasteners)  --  HW 9 / Proj
12  M 12/3  FINAL EXAM - 329-02 (4-7)
   F 12/7  FINAL EXAM - 329-01 (1-4)

Dates subject to change – see PolyLearn for latest version  Revised 11/16/12
Point Distribution:

- Homeworks* 54 points (6 points each) – Every MONDAY at 4:00pm online, except Veteran’s Day
- Quizzes 72 points (12 points each) – Every MONDAY, except Veteran’s Day (drop lowest two)
- Labs 150 points (15 points each) – Every Thursday, except Thanksgiving
- Exams** 360 points (Midterms: 90 points each; Comprehensive Final: 180 points).

* If you earn at least 50 points on homework, I will drop your lowest midterm or ½ of the final exam.
** You must earn at least 60% on the exams in order to pass the course. If you earn

Class Expectations:

- Complete the assigned reading BEFORE coming to lecture.
- PARTICIPATE – ask questions, make suggestions, work on examples, etc. Class is much more effective (and fun!) for all of us if you are engaged. Ask yourself: What do I want to get out of this class?
- Cell phones off or silent (& do not answer in class).
- Arrive on time and do not leave until class is finished. Let me know about any special circumstances.

Homework Expectations:

- Homework is where you really learn the material. Put in the time there and you will see the results in better understanding of the material (and better exam & course grades!).
- Homework will be assigned and submitted using McGraw-Hill’s CONNECT online system. You will need your CONNECT account or CONNECT Access Card to access the homeworks.
- Print out and complete the homework problems on your own paper. I may periodically ask for your written work. You may also use computer programs (e.g. EES, Matlab, Maple) to help solve problems.
- Your homework will be automatically submitted at 4:00 pm on the scheduled date.
- Complete work early: computer or network errors are NOT appropriate excuses for missing homework.
- Feel free to work together on homework, but only submit your own work. Any copying (from solutions manuals or other students) is plagiarism and will be treated as such.
- NO LATE HOMEWORK will be accepted. If you won’t be around the day HW is due, please work ahead.

Exam Expectations:

- Bring your textbook to class for all quizzes and exams!
- Short (10-15 minute) quizzes will be given in-class every Monday covering topics from the prior week.
- You may bring one 8½ x11 formula sheet to the in-class exams (but NO worked-out problems!).
- With limited in-class time for an exam, you need to be prepared beforehand. Don’t expect to have time to search for a similar example in the text while working on your exam.
- Your exam work should be complete, organized, and legible. Box your final answers.
- If you earn at least 50 homework points, I will drop your lowest midterm exam or ½ of the final exam.
- You must contact me IN ADVANCE to arrange a make-up if you will miss an exam.
- NO make-up quizzes will be given.

Lab Expectations:

- Bring your textbook to all labs.
- Read the lab assignments, ask questions, and complete any pre-work BEFORE coming to lab.
- Plan to work diligently during lab to minimize time after lab completing tasks.
- You will work in teams on most labs. Working in teams can be both challenging and rewarding. It is great preparation for industry work. Please put forward your best efforts on your teams, and notify me immediately of any team difficulties. I reserve the rights to change teams mid-lab if problems occur.