



Department of Mechanical Engineering
ME EN 3910 – Design of mechanical elements – Spring 2011

Syllabus

Instructor:	Professor Bart Raeymaekers , MEB 2122, bart.raeymaekers@utah.edu Research website: http://mech.utah.edu/precision
Office Hours:	M, W, F: 11:45am - 12:15am, M, W: 4:30pm - 5:00pm (MEB 2122), and by appointment.
Units:	3
Meeting Times:	M, W, F: 09:40am -10:30am, WEB L105
Engineering Lab:	CADE Lab and Engman Lab
Required Text:	<i>Shigley's Mechanical Engineering Design</i> , Budynas & Nisbett (9 th Ed.) Occasional extra readings will be made available on the course website.
Reference Texts:	<i>Mechanical Engineering Design</i> , Shigley & Mischke (5 th Ed.) <i>Fundamentals of Machine Component Design</i> , Juvinall & Marshek <i>Mashinenelemente</i> , Roloff & Matek <i>Mechanics of Materials</i> , Beer
Course Website:	Blackboard/WebCT
Pre-requisites:	ME EN 2450, 2650, 2655 and Upper Division ME Status
Co-requisites:	ME EN 3210, 3300, 3650
Course TA:	Manjunath Basavarajappa, Building 60 (ESB) - loft, manjunath3269@gmail.com Office hours: T, Th: 9:00am - 10:00am, F: 9:00am - 9:40am, and by appointment

Course summary:

ME EN 3910 is the first course in the Senior Design Sequence - ME EN 3910, 4000, 4010. The course introduces a wide range of standard mechanical elements that are extensively used in today's engineering world. The topics include reliability, fits and tolerances, rolling element and fluid film bearings, fasteners, welded joints, shafts, material selection, etc.

Course objectives:

This course will provide the student with the tools and methods to solve real world engineering problems that involve the design of mechanical elements. At the end of the course the student will be able to

1. apply basic principles such as statistics and curve fitting to realistic engineering design problems.

2. apply principles of strength of materials, fluid mechanics, and solid mechanics to calculate and design mechanical elements such as bolted and welded joints, bearings, and shafts.
3. use exciting state-of-the-art mechanical design techniques such as Monte Carlo simulation to complement traditional analysis.

Course topics:

- Part 1: Introduction to mechanical design
- Part 2: Material selection
- Part 3: Statistical considerations
- Part 4: Tolerances
- Part 5: Area moment of inertia
- Part 6: Design for static strength
- Part 7: Design for fatigue strength
- Part 8: Design of shafts
- Part 9: Bolted joints
- Part 10: Welded joints
- Part 11: Rolling element bearings
- Part 12: Lubrication

Deliverables:

Homework	20%
Two Midterms	2 x 20%
Final exam	40%

Midterm 1: Mo 02/14 (in class)

Midterm 2: Fri 03/18 (in class)

Final: Mo 05/02 8:00 am – 10:00 am

Homework is due before class. **No late homework will be accepted.**

The (N-2) best HW scores will be counted towards the final grade, with N the total #of HW sets.

All exams are “closed book”. Midterm material will be specified timely. Final exam will be comprehensive.

Academic dishonesty policy: ME EN 3910 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.

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/)