

## ME 4140/6140 Mechanical Design I Spring, 2015

**Instructor:** Dr. Craig Baudendistel, 775-3775, [craig.baudendistel@wright.edu](mailto:craig.baudendistel@wright.edu)  
Office Hours: MW 1:15-2:15 pm in 280H JC

**Textbook:** *Shigley's Mechanical Engineering Design*, 10<sup>th</sup> ed., McGraw-Hill, 2015

### Tentative Course Outline:

DATES	SUBJECT
<b>Week 1:</b> 1/12 - 1/16	Introduction Review of Stress Analysis
<b>Week 2:</b> 1/19 - 1/23	Normal and Shear Stresses in Beams Torsion, Combined Loading <b>NO SCHOOL – MLK Day – MONDAY 1/19</b>
<b>Week 3:</b> 1/26 - 1/30	Stresses in Curved Beams, Contact Stresses <b>PRE-REQ QUIZ - FRIDAY 1/30</b>
<b>Week 4:</b> 2/2 - 2/6	Stresses in Cylinders, Press & Shrink Fits
<b>Week 5:</b> 2/9 - 2/13	Deflection of Beams <b>EXAM #1 – FRIDAY 2/20</b>
<b>Week 6:</b> 2/16 - 2/20	Spring Rates, Shock and Impact Loading
<b>Week 7:</b> 2/23 - 2/27	Strain Energy, Castigliano's Theorem Compression Members and Buckling
<b>Week 8:</b> 3/2 - 3/6	<b><i>Spring Break - No Classes</i></b>
<b>Week 9:</b> 3/9 - 3/13	Compression Members, Cont. Statistical Approach to Design, Normal Distributions <b>EXAM #2 – FRIDAY 3/13</b>
<b>Week 10:</b> 3/12-03/14	Propagation of Error, Interference, Lognormal and Weibull Distributions, Fits and Tolerancing
FRIDAY 3/20	<b><i>Last day to drop with a grade of "W"</i></b>
<b>Week 11:</b> 3/23 - 3/27	Mechanical Properties, Strength and Cold Work Failure Theories for Static Loading
<b>Week 12:</b> 3/30 - 4/3	Failure Theories Cont., Stochastic Considerations
<b>Week 13:</b> 4/6 - 4/10	Introduction to Fracture Mechanics Fatigue Under Full-Reversed Loading, Life Prediction <b>EXAM #3 – FRIDAY 4/10</b>
<b>Week 14:</b> 4/13 - 4/17	Endurance Limit Modifying Factors, Fatigue Stress Concentration and Notch Sensitivity
<b>Week 15:</b> 4/20 - 4/24	Fatigue Under Fluctuating Stresses Fatigue Under Multiaxial Loading
FRIDAY 4/24	<b>PROJECT DUE - By 5:00 PM in 280 JC</b>
WEDNESDAY 4/29	<b>FINAL EXAM 12:30 - 2:30 PM</b>

**Homework:** Unless otherwise noted, weekly homework is due at the beginning of class on Friday. No late homework will be accepted without prior instructor approval.

**Course Web Page:** Electronic copies (PDF format) of all course materials, homework, and solutions will be posted on the course web page, which can be immediately accessed through Pilot (pilot.wright.edu). Access to the course web page requires a University campus computer account, which can be picked up at the CaTS Help Desk in room 025 Library Annex. Once you have your campus account, simply logon to Pilot and click on "Mechanical Design I". Since Pilot allows instructors to send course-related e-mail and message board announcements to the entire class, you should plan to check your campus e-mail account and the course Pilot page on a regular basis. Contact CaTS if you would like to forward your campus e-mail to another account.

**Design Project:** A design project will be assigned midway through the semester, and **MUST** be completed for a passing course grade.

**Exam Policy:** Materials permitted for the Pre-Req Quiz, Exam #1, and Exam #2 are a calculator and whatever you can fit on an 8.5"x11" **HANDWRITTEN** crib sheet. The crib sheet must be turned in with the exam. A total of **FOUR** 8.5"x11" crib sheets are permitted for the final exam. Any relevant tables and figures will be provided by the instructor.

**All exams will be video recorded by WSU Distance Learning Personnel. Please keep your eyes on your own exam. Anyone observed copying/cheating from another student would be subject to policies outlined by the Office of Academic Integrity.**

**Grading:** Homework 10%, Project 20%, Pre-Req Quiz 5%, Exam #1 15%, Exam #2 15%, Exam #3 15%  
Final Exam 20%

**Grading Scale:** A course average within each of the following ranges will guarantee you *at least* the corresponding letter grade: A: 90-100, B: 80-90, C: 70-80, D: 60-70, F: <60.