

Spring 2015

MCEN 3037: Experimental Design & Data Analysis

Course Syllabus

A primary objective of the Mechanical Engineering (ME) Department is to prepare each of our students for careers in the engineering profession. As professionals, engineers must meet high standards of technical competence and ethical behavior. According to the Accreditation Board of Engineering and Technology (ABET) code of ethics, engineers uphold and advance the integrity, honor and dignity of the engineering profession by:

1. Using their knowledge and skill for the enhancement of human welfare;
- 2.

5. Topics: A summary of the topics that would comprise complete coverage for this introductory course is given below. This is an ambitious topic list for a 2-hr/week course, and thus there will likely be changes in the list as the semester progresses.

I. BASIC STATISTICAL CONCEPTS

1. Sampling & Descriptive Statistics (Ch1)
2. Probability (Ch 2)
3. Probability Distributions (Ch4)
4. Confidence Intervals (Ch5)
5. Hypothesis Testing (Ch 6)
6. Correlation & Regression (Ch7)

II. MEASUREMENT FUNDAMENTALS

1. Measurement Error (Notes/handouts)
2. Uncertainty Analysis (Notes/handouts)
3. Propagation of Error (Ch 3)

III. DESIGN & ANALYSIS OF EXPERIMENTS

1. Introduction to Experimental Design (Notes/handouts)
2. Simple Comparative Experiments (Notes/handouts)
3. Single-Factor Experiments: ANOVA (Ch 9)
4. Two-Factor Experiments: ANOVA (Ch 9)

6. Course Policies

Students and faculty each have responsibility for maintaining an appropriate learning environment. Students who fail to adhere to such behavioral standards may be subject to discipline. Faculty have the professional responsibility to treat all students with understanding, dignity and respect, to guide classroom discussion and to set reasonable limits on the manner in which they and their students express opinions. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender variance, and nationalities. Details of these policies are available at : <http://www.colorado.edu/policies/classbehavior.html> and http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code.

In-Class Expectations: It is our expectation that each of you will be respectful to your fellow classmates and instructors at all times. In an effort to create a professional atmosphere within the classroom, it is requested that you:

- Arrive to class on time;
- Turn off your cell phone;
- Limit use of your laptop computer to class purposes;
- Put away newspapers and magazines;
- Refrain from having disruptive conversations during class;
- Remain for the whole class, or if you must leave early do so without disrupting others;
- Display professional courtesy and respect in all interactions related to this class.

Out-of-Class Expectations: Although many of the above stated policies address academic climate within the classroom, these policies should also be upheld outside of the classroom. As a member of the ME community, you are expected to consistently demonstrate integrity and honor through your everyday actions.

- Avoid disrupting ongoing meetings within faculty and staff offices. Please wait until the meeting concludes before seeking assistance.
- Respect faculty and staff policies regarding use of email and note that staff and faculty are not expected to respond to email outside of business hours

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- o Present the final answer including units with a **box** around it.

Exams: There will be two in-class exams and a final exam. The format for the exams will be reviewed in class. Note that any deviation from exam rules and instructions may be regarded as cheating and hence **academic dishonesty**

10. Grading

Policies: Exams will be given only at the time specified in the syllabus or mutually agreed upon after discussion in class. An appropriate opportunity will be provided to reconsider the points awarded for particular homework or exams; however, final course grades are not negotiable.

Point Distribution

Mid-Term Exam #1:	20%
Mid-Term Exam #2:	20%
Final Exam:	35%
Homework and Project:	25%

11. Important Dates

Martin Luther King holiday: Monday, January 19; no class.

Mid-Term Exam #1: Wednesday, February 18; 1:00-2:00 PM