

The University of Iowa
College of Liberal Arts and Sciences
Department of Statistics and Actuarial Science

22S:039

Probability and Statistics for the Engineering and Physical Sciences
Spring 2008

Instructor:

Rhonda DeCook
211 Schaeffer Hall, 335-3249
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DEO: Dr. Luke Tierney, 241 Schaeffer Hall

Time and Location:

MWF 12:30-1:20 LR2 Van Allen

Course Goals and Objectives:

In this course we will develop probabilistic reasoning and statistical solutions for problems encountered in engineering and the physical sciences.

Course Website: <http://www.stat.uiowa.edu/~rdecook/s39/s39.html>

Instructor Office Hours (or by appointment):

Tuesday 10-10:50am
Wednesday 10:30-11:20am
Thursday 1-2:30pm

Teaching Assistants:

Marcel Carcea	Kaimo Liao
Email: marcel-carcea@uiowa.edu	Email: kai-mo-liao@uiowa.edu
267 Schaeffer Hall, 335-0723	350 Schaeffer Hall, 335-2297
Office Hours: see course website	Office Hours: see course website

Required Text:

Applied Statistics and Probability for Engineers. Fourth edition by Douglas C. Montgomery and George C. Runger.

Final Exam: Wednesday, May 14 2008, 2:15 P.M. - 4:15 P.M.

Tutorial Lab:

Extra help beyond office hours is available at the Statistics Tutorial Lab.
See <http://www.stat.uiowa.edu/courses/tutorial-lab.html>

MINITAB Software:

Available in all Instructional Technology Centers (ITCs) such as 41 Schaeffer Hall. If you want a personal copy of the academic version, check out <http://www.minitab.com> which has a free academic short-term option, and longer options for purchase.

Lecture:

Students should read material prior to lecture. In the case of an absence, students are responsible for the material covered and must get the notes from a fellow student. Quizzes may be given during lecture. Quiz make-ups will not be given.

Weekly Discussions:

Attendance at Discussion is important. Quizzes may be given during this time period, and worksheets for extra practice may also be used. Quiz make-ups will not be given.

Topics Covered:

The collection, analysis, and display of information are discussed. Probability theory and statistics teach us how to characterize and model variability in processes and measurements. Probability theory, random variables, important discrete and continuous distributions, estimation of parameters and testing of hypotheses using sample data will be discussed. Regression methods will also be introduced. MINITAB, an interactive statistical computer package will be used.

Midterm Exams:

Two midterm exams will be given at times outside of the usual class time (see below). Both sides of an 8.5x11" piece of paper will be allowed for a formula sheet (handwritten).

LOCATION FOR MIDTERMS: Shambaugh Auditorium - Main library

Exam 1: Thursday, February 21 5:30-7:00pm

Exam 2: Thursday, April 10 5:30-7:00pm

Grading Policy:

Assessment in this course will be based on the following components:

- **Homework (10%)** - Assigned on a Friday and due the following Friday in class. The grader may grade only some of the assigned questions, but you are responsible for all. I will not accept late homework, but will instead throw-out your lowest homework score.
- **Quizzes* (10%)** - Short quizzes may be given in two manners: 1) written quizzes in lecture and 2) written quizzes in discussion. There are no quiz make-ups, but I will instead throw-out your lowest quiz score.
- **MINITAB Projects (10%)** - Two projects will be assigned. They will give you experience with MINITAB software, and with reporting results of a statistical analysis.
- **Exams* (70%)** - There will be 2 midterm exams and a final exam:
Midterms (20% each) given at the dates and times (and location) listed above.

The Final (30%) Wednesday, May 14 at 2:15pm. Both sides of three 8.5x11 pieces of paper can be used for a formula sheet for the final.

As an approximate guide, grades will be given as:	90-100	A
	80-89	B
	70-79	C
	60-69	D
	Below 60	F

Plus and minus grades will be given as deemed appropriate.

* No make-up exams or quizzes will be given unless there is an absence due to unavoidable circumstances as stated by University policy (documentation will be required in such a case). Missed exams will receive a score of 0. I will throw-out the lowest quiz score, so if you miss one quiz it will not hurt your overall score.

Tentative Class Schedule:

<u>Week</u>	<u>Topic</u>	<u>Chapter</u>
1	Introduction , Sample Spaces and Event	1 & 2
2	Probability Rules, Counting Techniques, Conditional Probability	2
3	Independence, Random Variables, Discrete Random Variables	2 & 3
4	Common Discrete Distributions	3
5	Continuous Random Variables	4
	Exam 1: Thursday, Feb. 21 5:30-7:00pm Shambaugh Aud.	
6	Continuous Random Variables	4
7	Joint Distributions	5
8	Correlation, Bivariate Normal, Numerical Summaries	5 & 6
	–Spring Break–	
9	Central Limit Theorem, Point Estimators	7
10	Confidence Intervals for μ and proportion p , t -distribution	8
	Exam 2: Thursday, April 10 5:30-7:00pm Shambaugh Aud.	
11	Hypothesis testing for μ and p , Goodness of Fit tests	9
12	Inference for $\mu_1 - \mu_2$ and $p_1 - p_2$	10
13	Simple Linear Regression (SLR), Least-Squares Estimators	11
14	Hypothesis test in SLR, Correlation, Checking Assumptions	11
15	Multiple Linear Regression	12
16	Final Exam: Wednesday, May 14 at 2:15pm	

Tentative days of no class:

- Friday Feb. 22, compensation for night exam 1
- Friday, April 11, compensation for night exam 2
- March 17-21, Spring Break Recess

Calculator:

There are many calculators out there that are appropriate for this class. Your calculator should be able to calculate *one-variable* and *two-variable statistics*. Whichever you choose, just make sure you are familiar with your own calculator.

Some calculators that perform such statistics:

TI 83 Plus, TI 86 (more expensive graphing calculators)

TI 30XIIB, TI 30XIIS, TI36X (less expensive, but have correct capabilities)

Resources for additional help:

Supplementary materials, such as handouts, will be distributed during class. If you miss class, please inquire if any materials were handed out. The Department of Statistics and Actuarial Science maintains a list of private tutors. See <http://www.stat.uiowa.edu/courses/tutors.html>.

Students complaints concerning faculty actions and Academic misconduct: University policies regarding academic misconduct and student complaints concerning faculty actions can be found at http://www.clas.uiowa.edu/students/academic_handbook/.

Understanding Sexual Harassment: Sexual harassment will not be tolerated in this class nor by the University. It subverts the mission of the University and threatens the well-being of students, faculty, and staff. Visit this site (<http://www.sexualharassment.uiowa.edu/>) for definitions, assistance, and the full University policy.

Students with disabilities: I would like to hear from anyone who has a disability which may require seating modifications or testing accommodations or accommodations of other class requirements, so that appropriate arrangements may be made. Please contact me during my office hours as soon as possible.

Administrative Home of the Course: The administrative home of this course is the College of Liberal Arts and Sciences, which governs academic matters relating to the course such as the add or drop deadlines, the second-grade-only option, issues concerning academic fraud or academic probation, and how credits are applied for various CLAS requirements. Please keep in mind that different colleges might have different policies. If you have questions about these or other CLAS policies, visit your academic advisor or 120 Schaeffer Hall and speak with the staff. The CLAS Academic Handbook is another useful source of information on CLAS academic policy: www.clas.uiowa.edu/students/academic_handbook/index.shtml

Reacting Safely to Severe Weather: The University of Iowa Operations Manual section 16.14 outlines appropriate responses to a tornado (i) or to a similar crisis. If a tornado or other severe weather is indicated by the UI outdoor warning system, members of the class should seek shelter in rooms and corridors in the innermost part of a building at the lowest level, staying clear of windows, corridors with windows, or large free-standing expanses such as auditoriums and cafeterias. The class will resume, if possible, after the UI outdoor warning system announces that the severe weather threat has ended.