

22S:039
Probability and Statistics for the Engineering and Physical Sciences
Fall 2007

Instructor:

Rhonda DeCook
211 Schaeffer Hall, 335-3249
rhonda-decook@uiowa.edu

Time and Location

MWF 12:30-1:20 Shambaugh Auditorium - Main Library

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):

Monday	1:30 - 2:20pm
Tuesday	11:30am - 12:30pm
Thursday	1:30 - 3pm

Teaching Assistants:

Marcel Carcea	Kwang Woo Ahn
Email: marcel-carcea@uiowa.edu	Email: kwangwoo-ahn@uiowa.edu
267 Schaeffer Hall, 335-0723	348 Schaeffer Hall, 335-0815
Office Hours: see class website	Office Hours: see course website

Required Materials:

- 1) **Text:** *Applied Statistics and Probability for Engineers*. Fourth edition by Douglas C. Montgomery and George C. Runger.
- 2) **Online Component:** WileyPLUS Online component
WileyPLUS class URL - <http://edugen.wiley.com/edugen/class/cls37406/>

• **Options -**

Hardcover and Online component bundled together at IMU Bookstore
Buy only the Online version (~\$50) and use Online version of text

If you go this route, in 2 weeks you'll get an offer from Wiley to buy the hardcover for ~\$62 in case you don't like the Online text. To get this offer, DO NOT opt out of Wiley emails.

Final Exam:

Thursday, December 20, noon - 2pm.

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.

Weekly Discussions:

Attendance at Discussion is important. Quizzes may be given during this time period, and worksheets for extra practice will also be used.

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). One side of an 8.5x11-inch piece of paper will be allowed for a formula sheet.

Exam 1: Thursday, September 20 5:30-7:00pm Shambaugh Auditorium

Exam 2: Thursday, November 1 5:30-7:00pm Shambaugh Auditorium

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. I will not accept late homework, but will instead throw-out your lowest homework score.
- **Quizzes* (10%)** - Short quizzes will be given in two manners: 1) written quizzes in lecture or discussion, and 2) through the on-line WileyPLUS component.
- **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 listed above.
 - The Final (30%) Thursday, December 20 at noon. Both sides of an 8.5x11 piece of paper can be used for a formula sheet for the final.

	90-100	A
	80-90	B
As an approximate guide, grades will be given as:	70-80	C
	60-70	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 Sept. 27, 5:30-7pm Shambaugh Aud.	
6	Continuous Random Variables	4
7	Joint Distributions	5
8	Correlation, Bivariate Normal, Numerical Summaries	5 & 6
9	Central Limit Theorem, Point Estimators	7
10	Confidence Intervals for μ and proportion p , t -distribution	8
	Exam 2: Thursday Nov. 1, 5:30-7pm 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
	–Thanksgiving Break–	
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: Thursday Dec. 20, noon - 2pm	

Days of no class:

Monday Sept. 3, Labor Day Holiday

Friday Sept. 28, compensation for night exam 1

Friday, Oct. 12, compensation for night exam 2 (notice this is not the day after exam 2)

Nov. 19-23, Thanksgiving 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 concernin faculty actions can be found at http://www.clas.uiowa.edu/students/academic_handbook/.

Understanding Sexual Harassment: Sexual harassment is reprehensible and will not be tolerated 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

DEO Contact Information:

Statistics and Actuarial Science

Luke Tierney, Chair 335-0712

luke-tierney@uiowa.edu

WileyPLUS online Component

Registering for WileyPLUS:

The first time you go to the WileyPLUS class URL:

<http://edugen.wiley.com/edugen/class/cls37406/>

you will need to register. Click on the REGISTER link at the above URL and proceed as directed. You will need to enter your access code that was in your textbook bundle, or the one you purchased on-line. You can also see some instructions on registering, practicing, doing assignments, etc. in WileyPLUS at:

<http://www.wileyplus.com/studentfdoc>

For future access and logging-in, you can go to:

<http://www.wileyplus.com/>

There is Technical Support (help) at:

<http://hesupport.wiley.com/wileyplus>

First assignment in WileyPLUS:

1. After registering for WileyPLUS, run the various “two minute” tutorials at *<http://www.wileyplus.com/studentfdoc>*.
2. Complete WileyPLUS Assignment 0 in Chapter 1