

## 22S:158 Experimental Design and Analysis

Spring 2009

## 22S:165 Applied Statistics II

**Time & Place:** MWF 9:30-10:20 61 Schaeffer Hall

**Prerequisites:** 22s:30 and 22s:152 (22s:158)  
22s:164 or equivalent (22s:165)

**Text:** Oehlert, G.W.(2000), *A First Course in Design and Analysis of Experiments*,  
New York: W.H. Freeman and Company.

### Other Reading Material:

Some reading materials may be placed on the class ICON website.

**Class website:** <http://www.stat.uiowa.edu/~rdecook/Design/Design.html>

**Instructor:** Rhonda DeCook, 211 Schaeffer Hall, 335-3249, rdecook@stat.uiowa.edu

**Office Hours:** Monday 1:30 - 3pm, and Tuesday 10 - 11:30am, or by appointment.

### Department:

Statistics and Actuarial Science  
Luke Tierney, Chair  
luke-tierney@uiowa.edu  
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### Course Goals and Objectives:

In this course we will learn the basics of experimental design and statistical analysis of data obtained from a number of experimental designs using SAS.

*How* the data is collected affects how the data should be analyzed.

When designing an experiment, one considers the *sources of variation* involved. Some sources of variation are of interest (e.g. treatment), while others can be considered a nuisance (e.g. subject-to-subject variation in some cases).

In designed experiments, we try to minimize the error in estimating the parameters (or effects) of greatest interest.

**Topics:** The earlier part of the course emphasizes intuitive ideas in experimental design. The later part of the course goes into more detail in modeling and analysis, and covers much of the Oehlert book.

**Computer Software:** We will use SAS as the primary tool for data analysis. We may also use some web-based Java applets provided by Professor Lenth that are used for simulations and sample-size determination.

**Coursework:** There will be weekly assignments (so about 14 altogether), three midterm exams, and a comprehensive final. Tentative dates for the midterm exams are in the next section. No late homework will be accepted (unless you have an excused university absence).

Some of the homework *may* be mini-project like in the you will have to design an experiment and collect the data using software (presently depends on the availability of such software).

Some of the homework problems and exam questions may be designated only for students in 22s:165 or only for students in 22s:158. Most questions will be from the Oehlert book, but some will come for other sources.

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

Homework	.....	20%
Exam 1	Friday February 20	20%
Exam 1	Wednesday April 1	20%
Exam 1	Wednesday April 29	20%
Final Exam	Wednesday May 13, Noon-2pm	20%

Any formulas deemed necessary for exams will be provided to you (and given to you beforehand for prior knowledge), so no handwritten notes will be used for exams.

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

Plus and minus grades will be given as deemed appropriate.

\*No make-up exams 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.

**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/](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](http://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.

**Student Classroom Behavior:** The ability to learn is lessened when students engage in inappropriate classroom behavior, distracting others; such behaviors are a violation of the Code of Student Life. When disruptive activity occurs, a University instructor has the authority to determine classroom seating patterns and to request that a student exit the classroom, laboratory, or other area used for instruction immediately for the remainder of the period. One-day suspensions are reported to appropriate departmental, collegiate, and Student Services personnel (Office of the Vice President for Student Services and Dean of Students).

**Final Examinations:** An undergraduate student who has two final examinations scheduled for the same period or more than three examinations scheduled for the same day may file a request for a change of schedule before the published deadline at the Registrar's Service Center, 17 Calvin Hall, 8-4 M-F, (384-4300).