

**22S:152**  
**Applied Linear Regression**  
Fall 2009

**Instructor:**

Rhonda DeCook  
211 Schaeffer Hall, 335-3249  
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**Class Time and Location:**

*Lecture:* MWF 9:30-10:20am 112 MacBride Hall  
*Lab:* Approximately alternate F 9:30-10:20am 41 Schaeffer Hall

**Course Goals and Objectives:**

Through hands-on experience in lab and homework, students will learn basic methods required for data analysis and interpretation. This includes learning the methods listed below, as well as learning how to draw conclusions and communicate analysis results.

Topics will include: simple and multiple linear regression, transformations, ANOVA, ANCOVA, model selection and checking, diagnostics, logistic regression, and generalized least squares. Other topics may also be covered, as well.

**Course Website:**

<http://www.stat.uiowa.edu/~rdecook/s152/s152.html>

**Office Hours** (or by appointment\*):

Monday            10:30 - 11:20am and 1:30 - 2:30pm  
Friday            10:30 - 11:20am

\*Feel free to email me if you have homework clarity questions or R software questions

**Text:**

*Applied Regression Analysis and Generalized Linear Models, 2nd edition* by John Fox

**Recommended Supplemental Text:**

*An R and S-PLUS Companion to Applied Regression* by John Fox

**R Software:**

R is open-source statistical software and freely available at <http://www.r-project.org>. It is also available in Instructional Technology Centers (ITCs) such as 41 Schaeffer Hall. See the course website for links to downloading and installing R on your own machine.

**Final Exam:**

\*\*\*  $\Rightarrow$  Friday, December 18, 7:30am - 9:30am.

**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.

**Lab:**

Attendance at lab is VITAL to your success in the class. We will go over fundamental R commands and discuss how to use R for statistical analysis.

**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>*

**Grading Policy:**

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

- **Homework (10%)** - Usually assigned on a Wednesday and due the following Wednesday in class. Homeworks 3, 5, & 8 will be assigned on Wednesday, but due the following Monday in order to have homework graded and returned before exam time. Homework turned-in 1 day late will get a 25% reduction. No late homework will be accepted after 2 days late.
- **Project (20%)** - A project will be assigned in the later part of the semester and completed in groups of 3 students. Included in the assignment is the oral presentation of the statistical analysis during the final week of class.
- **Midterm Exams\* (15% each)** - There will be three 1-hour midterm exams given in class. For each, you may use one side of an 8.5"x11" piece of paper for handwritten notes.
- **Final Exam\* (25%)** - The final will be comprehensive. You may bring four one-sided 8.5"x11" pieces of paper to the final for handwritten notes.

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.

## Tentative Class Schedule:

<u>Week</u>	<u>Topic</u>	<u>Chapter</u>
1	Numerical Summaries & Graphical Displays	1 & 3
2	Intro to regression, Probability Review, <b>R</b> software intro	2, Appendix A, & notes
3	Transformations , Simple Linear Regression	4, 5, & 6
4	Inference and Assumptions for Linear Regression	6
5	Multiple Linear Regression	6
	<b>Midterm Exam 1: Friday, September 25, in class.</b>	
6	Dummy Variables	7
7	1-way ANOVA	13, 8
8	Balanced 2-way ANOVA, & ANCOVA	8
	<b>Midterm Exam 2: Friday, October 16, in class.</b>	
9	Diagnostics 1: Outliers, Influential Points	11
10	Diagnostics 2: Non-normality, Non-constant Variance, Adequacy, and Multicollinearity	12 13
11	Model Selection, Logistic Regression	22 &15
12	Finish Logistic Regression	15
	<b>Midterm Exam 3: Friday, November 13, in class.</b>	
13	Poisson Regression	14
	–Thanksgiving Break–	
14	Generalized Least Squares, Polynomial Regression	16 & 17
15	Oral presentations & Class evaluations	
16	<b>Final Exam: Friday Dec. 18, 7:30am - 9:30am</b>	

## Administrative Home of the Course:

The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed in 120 Schaeffer Hall or see the CLAS Student Academic Handbook:  
[www.clas.uiowa.edu/students/academic\\_handbook/index.shtml](http://www.clas.uiowa.edu/students/academic_handbook/index.shtml)

## Electronic Communication :

University policy specifies that students are responsible for all official correspondences sent to their standard University of Iowa e-mail address (@uiowa.edu). Students should check this account frequently. (Operations Manual, III.15.2. Scroll down to k.11.)

## Academic Fraud :

Plagiarism and any other activities when students present work that is not their own are academic fraud. Academic fraud is a serious matter and is reported to the departmental DEO and to the Associate Dean for Undergraduate Programs and Curriculum. Instructors and DEOs decide on appropriate consequences at the departmental level while the Associate Dean enforces additional consequences at the collegiate level. See the CLAS Student Academic Handbook.

**Making a Suggestion or a Complaint :**

Students with a suggestion or complaint should first visit the instructor, then the course supervisor, and then the departmental DEO. Complaints must be made within six months of the incident. See the CLAS Student Academic Handbook.

**Accommodations for Disabilities :**

A student seeking academic accommodations should first register with Student Disability Services and then meet privately with the course instructor to make particular arrangements. [www.uiowa.edu/~sds/](http://www.uiowa.edu/~sds/)

**Understanding Sexual Harassment :**

Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the UI Comprehensive Guide on Sexual Harassment at [www.uiowa.edu/eod/policies/sexual-harassment-guide/index.html](http://www.uiowa.edu/eod/policies/sexual-harassment-guide/index.html) for assistance, definitions, and the full University policy.

**CLAS Final Examination Policies:**

Final exams may be offered only during finals week. No exams of any kind are allowed during the last week of classes. Students should not ask their instructor to reschedule a final exam since the College does not permit rescheduling of a final exam once the semester has begun. Questions should be addressed to the Associate Dean for Undergraduate Programs and Curriculum.

**Reacting Safely to Severe Weather :**

In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue if possible when the event is over. (Operations Manual, IV.16.14. Scroll down to e. h. and i.)

**DEO Contact Information:**

Statistics and Actuarial Science  
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