

**Department of Epidemiology and Biostatistics  
College of Public Health  
University of Georgia  
BIOS 7020  
Introduction to Biostatistics II  
Spring 2009**

**Course Information**

Instructor: Sangwook Kang  
Office Location: 129a Coverdell  
Phone: (706) 583-0211  
Email: skang@uga.edu  
Office Hours: Wednesday, 2:30 – 4:30pm, or by appointment  
TA: Melissa Amyx  
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**Course Meeting Time and Location**

Building: Paul D. Coverdell Center  
Room: S175  
Day: Tuesday, Thursday  
Time: 09:30 – 10:45 am

**Textbooks and Other Required Course Material**

Textbook (required): Vittinghoff, Glidden, Shiboski, and McCulloch (2007). Regression Methods in Biostatistics: Linear, Logistic, Survival, and Repeated Measures Models. Springer.

References:

- Rosner (2005). Fundamentals of Biostatistics, 6<sup>th</sup> ed., Duxbury Pressing.
- Baldi and Moore (2008). The Practice of Statistics in the Life Sciences, W.H. Freeman.
- Muller and Fetterman (2003). Regression and ANOVA: An Integrated Approach Using SAS Software, SAS Publishing.
- Stokes, Davis and Koch (2001). Categorical Data Analysis Using the SAS System, 2<sup>nd</sup> ed., SAS Publishing.
- Agresti (2007). An Introduction to Categorical Data Analysis, 2<sup>nd</sup> ed., Wiley Series in Probability and Statistics.
- Allison (1995). Survival Analysis Using the SAS System: A Practical Guide., SAS Publishing.
- Collett (2003). Modeling Survival Data in Medical Research, 2<sup>nd</sup> ed., Chapman & Hall/CRC

Software: SAS (available in computer labs located in 104 Environmental Health Science, and 307 Statistics. Students may lease SAS from MSD; see <http://www.msduga.edu>)

Lecture notes, SAS programs, data and announcements will be posted on WebCT.

## Course Description

Introduction to a variety of statistical tools with applications in public health and the biological sciences, including linear regression, analysis of variance (ANOVA), categorical data analysis, logistic regression, and survival analysis. Motivating examples will be drawn from the literature in the health, biological, medical, and behavioral sciences.

Prerequisites: BIOS 7010 or equivalent courses in statistics (STAT 6310) or permission of instructor

## Course Learning Objectives

Students completing this course should be able to select what tools are appropriate to answer specific scientific questions, such as using the appropriate regression model to characterize the relationship between an outcome and covariates, implement their use using statistical software such as SAS, communicate in writing the methods, results, and conclusions of statistical analyses, and understand the statistical contents of papers in the public health and biomedical literature.

## Course Requirements for Grading Purposes

Homework:

- There will be roughly one homework assignment per week.
- Completing and understanding the homework will be necessary for good performance on the exams.
- For all assignment requiring the use of the computer, attach a copy of your SAS program and output to the end of those assignments. However, all answers are to be given on a separate sheet of paper.
- In general, only hard copy of the homework is accepted, however, under special circumstances, you may send your homework by e-mail in a PDF format.
- All homework assignments are due at the beginning of the class period on the date on which they are due. No delay will be allowed.
- Students are encouraged to work together on homework, but copying someone else's work always an academic honesty violation.

Quiz: There will be two or three quizzes. Each of them will be given roughly once a month. Each quiz and homework will be weighted equally for final grading.

Exams:

- There will be two midterm exams and a final exam. All exams will be in-class exams and the final exam will also have take-home portion. Midterm and final exam dates are summarized in the following:

Midterm 1 (Tuesday, February 17, 9:30 – 10:45 am: in-class),

Midterm 2 (Tuesday, March 31, 9:30 – 10:45 am: in-class),

Final (Tuesday, April 28, 9:30 – 10:45 am: in-class,

Thursday, May 7, 2009, 8:00 – 11:00 am, take-home)

- All in-class exams are closed book exams. For each in-class exam, you will be permitted to bring one letter-size sheet of paper (front and back) containing any notes you may desire. In addition, a calculator should be brought to each in-class exam.

## Topical Outline

Date	Topic of Class
JAN 8	Overview and Introduction
13,15	Simple Linear Regression: Introduction
20	Introduction to SAS
22,27	Simple Linear Regression: Model Diagnostics
29	Simple Linear Regression: Correlation
FEB 3, 5	Multiple Linear Regression: Introduction
10	Multiple Linear Regression: Model Diagnostics
12	Multiple Linear Regression: Best Model Selection
17	<b>Midterm I (in-class): 9:30 – 10:45AM</b>
19	Multiple Linear Regression: Using Matrix Notation
24	Multiple Linear Regression: Interaction and etc.
26	ANOVA: Introduction
MAR 3	ANOVA: 2-Way ANOVA
5	ANOVA: Experimental Designs
10, 12	Spring Break
17	Guest Lecture
19	ANOVA: ANCOVA
24	ANOVA: Contrast
26	ANOVA: Multiple Comparison Procedure
31	<b>Midterm II (in-class): 9:30 – 10:45AM</b>
APR 2	Categorical Data Analysis: Introduction
7	Categorical Data Analysis: (Sets of) 2 x 2 Table(s)
9	Categorical Data Analysis: Simple Logistic Regression
14	Categorical Data Analysis: Multiple Logistic Regression
16	Survival Analysis: Introduction
21	Survival Analysis: Cox Regression
23	Survival Analysis: Additional Topics
28	<b>Final Exam (in-class): 9:30 – 10:45AM</b>
May 7	<b>Final Exam (take-home): 8 – 11AM</b>

## **Grading Policy**

Weekly homework, quizzes: 25%  
Midterm 1: 20%  
Midterm 2: 20%  
Final: 30% (15% + 15%)  
Class attendance and participation: 5%

## **Make-Up Policy**

You must contact the instructor in advance if you are unable to take an exam at its scheduled time. Arrangements may then be made for a make-up exam.

## **Attendance Policy**

Attending all the classes is highly recommended. *Those who miss classes too often may not get full 5% credit.*

## **University Honor Code and Academic Honesty Policy**

All academic work must meet the standards contained in “A Culture of Honesty.” All students are responsible to inform themselves about those standards before performing any academic work. More detailed information about academic honesty can be found at

<http://www.uga.edu/ovpi/honesty/acadhon.htm>

## **Students with Disabilities**

Students with disabilities who require reasonable accommodations in order to participate in course activities or meet course requirements should contact the instructor or designate during regular office hours or by appointment.

## **General Disclaimers**

*The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.*