**Statistical Analysis of Scientific Data**  
**GE398 - Fall 2010**

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Office Hours: T-Th 1:30-2:30, Devlin 312  
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Lecture: T Th 10:30-11:45, Devlin 201

This syllabus provides a basic summary of the course. Other course materials will be posted on the course web site, which is on the BC Blackboard course management system.

**Description of Course:** Scientific investigations involve gathering data, analyzing data for testing hypotheses, and interpreting the results of data analysis to develop theories about how the natural world works. This course covers statistical methods commonly used to analyze and interpret many different types of scientific data. In addition to the data analysis and interpretation aspects of this course, we will also be concerned with how to effectively report and present the results of scientific investigations. Topics include: methods of organizing and describing data, probability, random variables, the normal distribution, sampling, confidence intervals, hypothesis testing, comparing two populations, correlation, and regression. The term project requires students to use the statistical concepts taught in class to analyze a real data set, and to present the results of that investigation in both oral and written form.

**Textbook:** *Introduction to Probability and Statistics (13th Edition)* by W. Mendenhall, R.J. Beaver, and B.M. Beaver.

**Some Suggested Reading (Not Required):**
- *The Cartoon Guide to Statistics* by Larry Gonick and Woolcott Smith
- *Uncertain Science... Uncertain World*, by H.N. Pollack
- *How to Lie with Statistics*, by Darrell Huff

**Grades will be based on:**

1. Two In-class Exams (20% of course grade each). Tentative dates are: October 19, 2010 and November 18, 2010.  
2. Final Exam (20% of course grade), December 20, 2010, 12:00 PM.  
3. Homework Assignments (20% of course grade).  
4. Term Project: Paper and Presentation (20% of course grade).

**Research Project:** For this course, you will conduct a scientific research project on any topic that you are interested in investigating. Work on this research project will involve in-class presentations and discussions of your progress, a Research Report (due near the end of the semester), and an Oral Presentation of your project (also near the end of the semester).

**Lecture Outline:** The following is a tentative list of topics that will be covered this semester.

- Describing Data with Graphs
- Describing Data with Numerical Measures
- Describing Bivariate Data
• Probability and Probability Distributions
• The Normal Probability Distribution
• Sampling Distributions
• Large-Sample Estimation
• Large-Sample Tests of Hypotheses
• Inference from Small Samples
• Regression and Correlation
• Nonparametric Statistics
• Possible Additional Topics