

# Statistics for Scientists STAT 3000

Utah State University  
Spring 2009

## Lecture Time & Location:

Section 1: MWF 9:30-10:20 AM

Section 4: MWF 1:30-2:20 PM

**Instructor:** Dr. Mevin Hooten  
**Office:** 301 Lund  
**Email:** mevin.hooten@usu.edu  
**Web:** <http://www.math.usu.edu/~hooten/stat3000/>  
**Office Hours:** Mon/Wed 2:30-4:00 PM  
**Text:** *Probability and Statistics for Engineers and Scientists*, by Anthony Hayter  
**Prerequisite:** MATH 1210 (or equivalent)

**Grading:** 4 Midterm Exams (drop one and 25% each for rest)  
Homework (25%)

Scale:	%	Grade	%	Grade
	94-100	A	76-79.9	C+
	90-93.9	A-	73-75.9	C
	86-89.9	B+	70-72.9	C-
	83-85.9	B	65-69.9	D+
	80-82.9	B-	60-64.9	D
			00-59.9	F

## Notes:

- Homework and Computational assignments are critical for understanding and being able to apply the content presented in the course. Homework is due at the **beginning** of the course meeting time on the due date specified. Late assignments will **not** be accepted.
- Calculus is a prerequisite for this course. A working knowledge of calculus will allow for a much better understanding of the course content. On the other hand, insufficient knowledge of calculus will detract from the intuitiveness of course material. This is a good time to brush up on derivatives and integrals.

## Course Topics:

General	Specific
Review Introduction	Notation, Algebra, Calculus Overview
Probability	Basic Definitions Basic Properties of Probability Venn Diagrams Subtraction and Addition Rule Conditional Probability Independence Multiplication Rule Law of Total Probability Bayes Rule Counting Methods
Random Variables	Types of Random Variables PMF PDF and CDF Expectation and Variance Quantiles Joint Distributions Covariance / Correlation Conditional Distributions Functions of Random Variables
Discrete Distributions	Bernoulli Distribution Binomial Distribution Geometric Distribution Negative Binomial Distribution Poisson Distribution
Continuous Distributions	Uniform Distribution Exponential Distribution Normal and Std. Normal Distribution Central Limit Theorem
Describing Data	Other Distributions (Chi-Square, t, F) Describing Data (location and shape) Describing Data (graphical)
Estimation	Sampling Distributions Point Estimation Interval Estimation
Hypothesis Tests	One Sample Hypothesis Tests P-Values Two Sample Hypothesis Tests
ANOVA	ANOVA (one factor) Pairwise Comparisons ANOVA (RCB) Chi-Square Tests
Regression	Simple Linear Regression Correlation Multiple Linear Regression

## Course Schedule:

Date	Day	Topic	Chapter	HW #
20090105	Monday	Syllabus, Review		
20090107	Wednesday	Introduction, Probability	1	
20090109	Friday	Probability	1	
20090112	Monday	Probability	1	1
20090114	Wednesday	Probability	1	
20090116	Friday	Probability	1	
20090121	Wednesday	Probability	1	2
20090123	Friday	Probability	1	
20090126	Monday	Probability	1	
20090128	Wednesday	<b>Exam 1</b>		3
20090130	Friday	Random Variables	2	
20090202	Monday	Random Variables	2	
20090204	Wednesday	Random Variables	2	4
20090206	Friday	Random Variables	2	
20090209	Monday	Random Variables	2	
20090211	Wednesday	Discrete Distributions	3	5
20090213	Friday	Discrete Distributions	3	
20090217	Tuesday	Discrete Distributions	3	
20090218	Wednesday	Continuous Distributions	4	6
20090220	Friday	Continuous Distributions	4, 5	
20090223	Monday	Continuous Distributions	5	
20090225	Wednesday	<b>Exam 2</b>		7
20090227	Friday	Data, Estimation	6,7	
20090302	Monday	Estimation	7	
20090304	Wednesday	Estimation, Hypothesis Tests	7, 8	8
20090306	Friday	Hypothesis Tests	8	
20090316	Monday	Hypothesis Tests	8	
20090318	Wednesday	Hypothesis Tests	9	9
20090320	Friday	Hypothesis Tests	9	
20090323	Monday	Hypothesis Tests	9	
20090325	Wednesday	ANOVA	11	10
20090327	Friday	ANOVA	11	
20090330	Monday	ANOVA	11	
20090401	Wednesday	<b>Exam 3</b>		11
20090403	Friday	ANOVA	11	
20090406	Monday	ANOVA	11	
20090408	Wednesday	Chi-Square Tests	10	
20090410	Friday	Regression	12	12
20090413	Monday	Regression	12	
20090415	Wednesday	Regression	12	
20090417	Friday	Regression	12	
20090420	Monday	Regression	13	13
20090422	Wednesday	Regression	13	
20090424	Friday	Regression	13	
20090427	Monday	<b>Final Exam (Sec. 4, Ex. 4)</b>		
20090429	Wednesday	<b>Final Exam (Sec. 1, Ex. 4)</b>		

## **Other:**

### **Disabilities:**

Students with physical, sensory, emotional or medical impairments may be eligible for reasonable accommodations in accordance with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973. All accommodations are coordinated through the Disability Resource Center (DRC) in Room 101 of the University Inn, 797-2444 voice, 797-0740 TTY, or toll free at 1-800-259-2966. Please contact the DRC as early in the semester as possible. Alternate format materials (Braille, large print or digital) are available with advance notice.

### **Computing:**

Handheld calculators are not powerful enough for many of the calculations and plots required for statistical analyses. We will utilize the R statistical computing package (free for all systems) in this course. R can be found on the computers in many of the campus labs. The software itself has a learning curve, but is flexible and powerful. See course website for links to download R on your personal computer.

### **Courtesy:**

I expect you to be courteous to your fellow students and to me. Turn off pagers and cellular phones before class, sleep at home rather than in class, and please provide me with your full attention during class. I reserve the right to adjust your grade accordingly for repeated courtesy violations.