



Fall 2011

STAT 651-603 (Statistics in Research I) MWF 1:50-2:40, BLOC 150

Course description and prerequisites

A non-calculus exposition of the concepts, methods and usage of parametric and nonparametric statistical data analysis. Intended for graduate students from various disciplines (other than Statistics). Prerequisite: MATH 102 or equivalent.

Course objectives

STAT 651 is designed to introduce students to statistical methods and software, particularly in ways that are useful for their research. By the end of the course students should have a conceptual understanding of statistical analysis, and should be able to choose appropriate statistical procedures for their data. They should be able to carry out statistical tests, using software as appropriate, and draw valid conclusions.

Instructor

Uschi Müller-Harknett

Office: BLOC 432; **Tel.:** (979) 862-2049; **Mail:** uschi@stat.tamu.edu

Office hours: M 10-11, MW 3-4, and by appointment

Textbook and other resources

Your main resources for this course are (1) our regular classes, and (2) the textbook: *An Introduction to Statistical Methods and Data Analysis*, 6th Ed., by R. Lyman Ott and Michael Longnecker. The statistical software used in this course is JMP. You will receive more information on this at the beginning of the semester.

Homework and additional material will be posted on the web. You will be sent details by email.

Grader / help sessions

Grader: Hyuneui Lee **Mail:** hyuneui@neo.tamu.edu

Office: BLOC 422 **Office hours:** MW 4:00-5:30

Additional help sessions: MW 2-4, TR 11-1 and F 3-5 in the Blocker Open Access Lab

Course topics and exam dates

Exams will be held in class on Friday, September 30, and Friday, November 4 (Midterms I and II), and on Tuesday, December 13, 10:30 - 12:30 (Final).

| Topic | Required reading |
|---|------------------|
| I Introduction and data description <ol style="list-style-type: none">1. What is statistics?2. Graphical techniques for looking at data3. Numerical measures for data | Ch. 1,2,3 |
| II Probability distributions <ol style="list-style-type: none">1. Basic concepts for discrete and continuous random variables2. Sampling distributions3. Central limit theorem | Ch. 4 |

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| III Confidence intervals and hypothesis testing | Ch. 5,6,7 |
| 1. Basic concepts of interval estimation | |
| 2. Basic concepts of hypothesis testing | |
| 3. Inference about a single mean | |
| 4. Inference about two means | |
| IV Analysis of categorical data | Ch. 10 |
| 1. Chi-square test of independence | |
| 2. Inference about single proportions | |
| 3. $r \times c$ contingency tables | |
| V One-way analysis of variance | Ch. 8,9 |
| 1. Basic notions behind ANOVA | |
| 2. F-test for equality of means | |
| 3. Model for one-way ANOVA | |
| 4. Nonparametric alternative | |
| 5. Introduction to multiple comparisons | |
| VI Linear regression and correlation | Ch. 11,12 |
| 1. Basic concepts of linear regression model | |
| 2. Correlation | |
| 3. Inference about regression parameters | |
| 4. Inference about mean of y | |
| 5. Prediction intervals at a given x | |

Course grade

Your grade will be based on your performance over the semester. **Homework** will make up 10% of the course grade, the two **midterm exams** will count for 25% each and the **final exam** for the remaining 40%. Your lowest homework score, and the lowest scoring answer at each exam, will be dropped.

If you have to miss one of the midterm exams due to illness or other circumstances beyond your control, please notify me, or the Department of Statistics main office, *before* the exam. If the absence is approved, the final exam score will be given additional weight to compensate.

The previous two paragraphs set out the **only** methods that will be used to determine course grades. If you feel that personal circumstances are affecting your academic performance, or are concerned that your work is not going to earn you the grade that you require for some purpose (e.g. getting/keeping an assistantship or a scholarship), please explore your options and take appropriate action in good time.

Other course information

Regular class attendance is assumed. I do not monitor attendance or give unannounced tests. However, syllabus details, including homework assignments and test dates, may be changed by in-class announcements. Anything that is missed because a student is not in class is the student's responsibility.

Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit <http://disability.tamu.edu>

Academic integrity and fairness

Honor code: *"An Aggie does not lie, cheat, or steal, or tolerate those who do."*

I aim to treat you fairly. I expect you to treat me and your fellow students fairly. I take academic honesty seriously, and expect you to do so as well. You should be aware of the definitions of "academic misconduct" at <http://aggiehonor.tamu.edu/Student Rules/definitions.html>.