

Location: Molecular Biology 1428
Time: 2:10-3:30 p.m. Tuesday and Thursday
Instructor: Dan Nettleton dnett@iastate.edu <http://www.public.iastate.edu/~dnett/>
Office: Snedecor Hall 111 (phone: 515-294-7754)
Hours: 1:00-2:00 Monday and 3:30-4:30 Thursday or other times by appointment
Text: *Linear Models: Least Squares and Alternatives* (2nd edition)
C. R. Rao and H. Toutenburg

Purpose of the Course:

Students will have the opportunity to learn the statistical theory of linear models. This theory forms the basis for many of today's most widely used statistical methods.

Prerequisites:

STAT 500 or 402 or 404, STAT 542 or 447, and a course in matrix algebra

Grading:

Homework	30%
Exam 1	20% Tuesday, September 25, 2:10-3:30 P.M.
Exam 2	20% Thursday, November 8, 2:10-3:30 P.M.
Final Exam	30% Thursday, December 13, 7:30-9:30 A.M.

On exam days, be sure to arrive early with a calculator and pen or pencil. No make-up exams will be given unless circumstances are exceptional. Your final course score will be determined by the following formula:

$$\text{Course Score} = 0.3 H + 0.2 E1 + 0.2 E2 + 0.3 F$$

where H, E1, E2, and F represent the score out of 100 possible on Homework, Exam 1, Exam 2, and the Final Exam, respectively. Letter grades will be assigned according to the course scores. Students with similar course scores (as judged by the instructor) will receive similar letter grades. The order of the course scores will match the order of the letter grades.

All students have the opportunity to earn good grades in Statistics 611 by learning the course material well. Please let your instructor know of any difficulties as soon as possible. If a student has a disability that qualifies under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act and requires accommodations, he/she should contact the Disability Resources (DR) office for information on appropriate policies and procedures. DR is located on the main floor of the Student Services Building, Room 1076. Their phone number is 515-294-6624.

Homework Guidelines:

- The purpose of all homework assignments in Statistics 611 is to help you learn the course material.
- All homework assignments will be posted at <http://www.public.iastate.edu/~dnett/S611/hw.shtml>.
- Assignments are due at the beginning of class on the dates specified.
- No late homework will be accepted unless circumstances are exceptional.
- Answers to homework assignments should be neatly written and well organized with no extraneous information.
- You are welcome to work with other students on homework problems. You must, however, write your own answers. Copying another's work is prohibited.

Intended Course Coverage:

1. Matrix Algebra Preliminaries
2. Least Squares Estimation Theory
3. Multivariate Normal Distributions, Non-Central Chi-Square and F Distributions, Distributions of Quadratic Forms
4. Hypothesis Testing, Confidence Regions, Multiple Comparisons
5. Mixed-Effects Models
6. Estimation of Variance Components and Related Problems
7. Alternative methods including shrinkage estimation, partial least squares, principal components regression, ridge regression, LASSO, robust regression, and related procedures