

Math 439: Linear Statistical Models

Fall 2013

Instructor: Dr. Todd Kuffner

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Web Page: Blackboard or <http://www.math.wustl.edu/~kuffner/Math439/>
Lectures: Mon and Wed 4-5:30pm, Room 218, Cupples I
Office Hours: Mon 12-1, Tues 12-1, or by appointment

Course Description: Theory and practice of linear regression, analysis of variance (ANOVA) and their extensions, including testing, estimation, confidence interval procedures, modeling, regression diagnostics and plots, polynomial regression, collinearity and confounding, model selection, geometry of least squares. The theory will be approached mainly from the frequentist perspective and use of the computer (mostly R) to analyze data will be emphasized. We will cover most of the material corresponding to the first 11 chapters of the required text, along with some supplementary material where needed.

Prerequisites: Math 3200 and a course in linear algebra (such as Math 309 or 429), or permission of instructor.

Required Text: *Introduction to Linear Regression Analysis*, Montgomery, D.C., E.A. Peck and G.G. Vining, 5th Edition, Wiley, 2012, ISBN: 9780470542811.

Recommended Text:

- *Solutions Manual to Accompany Introduction to Linear Regression Analysis, Fifth Edition*, prepared by A.G. Ryan, Wiley, 2013, ISBN: 9781118471463.

References:

- *Linear Models with R*, Faraway, J.L., Chapman & Hall/CRC, 2004, ISBN: 1584884258.

- *Applied Linear Statistical Models*, Kutner, M.H., C.J. Nachtsheim, J. Neter and W. Li, 5th Edition, McGraw-Hill, 2004, ISBN: 0072386886.
- *A Primer on Linear Models*, Monahan, J.F., Chapman & Hall/CRC, 2008, ISBN: 1420062018.

Computing: Students are required to use **R** to complete all homework assignments. **R** is freely available for download from <http://cran.r-project.org/>.

Grades: There will be assigned homework, two midterm exams and a cumulative final exam. Final grades will be determined according to the following weights:

Homework	40%	
First Midterm Exam	15%	in class on Monday 7th October
Second Midterm Exam	15%	in class on Wednesday 13th November
Final Exam	30%	6-8pm, Friday 13th December

The numerical grade will be converted to a letter grade using the following scale:

[95,100]	A+	[83,85)	B+	[65,75)	C
[87,95)	A	[77,83)	B	[60,65)	D
[85,87)	A-	[75,77)	B-	<60	F