

STAT 360 (MATH 601A)
Linear Models
Fall 2014

Instructor*: _____

Office/Tel No.: _____

Office Hours: _____

*Students should get the above information from their instructor during class time. The instructor is the person to contact should there be any questions about the course.

Course Examiner: Dr. D. Sen

Text: *Applied Linear Regression Models*, 4th Edition, by Kutner, Nachtsheim and Neter, McGraw Hill-Irwin, 2004.

Calculators: Only calculators approved by the Department (with a sticker attached as proof of approval) are permitted in the class test and final examination. The preferred calculators are the **Sharp EL 531** or the **Casio FX 300MS**, available at the Concordia Bookstore.

Final Grade:

- a) Assignments (12%)
- b) Two mid-term tests (40%)
- c) Final examination (48%)

Note:

- 1) Assignments are compulsory. Late assignments will not be accepted.
- 2) Mid-term test I will be held on **October 9, 2014** and the mid-term test II will be held on **November 6, 2014**. These exams, as well as the final, will be closed book exams.
- 3) Please note that there are **no supplemental privileges** in this course.

Week	Sections	Topics to be covered
1	1.3, 1.6, 1.7, 1.8	Simple linear regression models; estimation of regression function; estimation of error term variance; normal error regression model.
2	2.1, 2.2, 2.4	Estimation of β_0 and β_1 ; interval estimation of $E(Y_h)$.
3	2.5, 2.6, 2.7	Introduction to MINITAB, prediction of new observation; confidence band for regression line; ANOVA approach to regression analysis.
4	2.8, 2.9, 3.2	General linear test approach; coefficient of correlation; residuals.
5	3.3, 3.7	Diagnostics for residuals; F-test for lack of fit.
6	4.1, 4.2 MID-TERM I	Joint estimation of β_0 and β_1 ; simultaneous estimation of mean responses. MID-TERM I will cover material up to section 3.7.
7	4.3, 4.4, 5.6	Simultaneous prediction intervals for new observations; regression through origin; inverse of a matrix.
8	5.8, 5.9	Random vectors and matrices; differentiation of a vector and scalar function of $n \times n$ matrix; simple linear regression model in matrix form.
9	5.10, 5.11, 5.12, 5.13	Least square estimation of regression parameters; fitted values and residual; ANOVA results; inferences in regression models.
10	6.1, 6.2, 6.3 MID-TERM II	Multiple linear regression models; general linear regression model in matrix terms; estimation of regression coefficients. MID-TERM II will cover material section 4.1 to section 5.13.
11	6.4 - 6.7, 6.8, 6.9	Fitted values and residuals; ANOVA results; inferences about regression parameters; inferences about mean response and prediction of new observation; diagnostics and remedial measures.
12	7.1, 7.2, 7.3	Extra sum of squares; application of extra sum of squares; tests concerning regression coefficients.
13	7.4, 7.5, 7.6; Review	Coefficient of partial determination; standardized multiple regression models; multicollinearity and its effects.