Department of Mathematics & Statistics
Concordia University

> **STAT 360**
> Linear Models
> *Summer 2015*

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Office Hours: Wednesday, 16:00-17:30.

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

Final Grade: a)   Assignments (12%)
b)   Mid-term test (40%)
c)   Final examination (48%)

IMPORTANT: **PLEASE NOTE THAT THERE IS NO "100% FINAL EXAM" OPTION IN THIS COURSE.**

Note: 1)   Assignments are compulsory. Late assignments will not be accepted.
2)   A mid-term exam will be held on **May 27, 2015**. This exam, as well as the final, will be closed book exams.
3)   Please note that there are **no supplemental privileges** in this course.

Lectures	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	Inferences concerning β_1 and β_0; 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, 3.1, 3.2	General linear test approach; descriptive measures of linear association between X and Y; diagnostics for predictor variable; residuals.
5	3.3, 3.4, 3.7	Diagnostic for residuals; overview of tests involving residuals; F-test for lack of fit.
6	4.1, 4.2, 4.3, 4.4	Joint estimation of β_0 and β; simultaneous estimation of mean responses; simultaneous prediction intervals for new observations; regression through origin.
7	**Midterm**	**Mid Term exam will cover material up to section 4.4.**
8	5.6, 5.8, 5.9, 5.10	Inverse of a matrix; random vectors and matrices; simple linear regression model in matrix terms; least square estimation of regression parameters
9	5.11, 5.12, 5.13	Fitted values and residuals; ANOVA results; inferences in regression analysis.
10	6.1, 6.2, 6.3	Multiple regression models; general linear regression model in matrix terms; estimation of regression coefficients.
11	6.4, 6.5, 6.6	Fitted values and residuals; ANOVA results; inferences about regression parameters.
12	6.7, 6.9, 7.1, 7.2	Estimation of mean response and prediction of new observation; multiple regression with two predictor variables. Extra sum of squares & its application.
13, 14	7.3, 7.4, 7.5 & Review	Tests concerning regression coefficients; coefficient of partial determination; standardized multiple regression models.