Department of Mathematics & Statistics
Concordia University

STAT 360 (MATH 601), Sec. D
Linear Models
Fall 2018

Instructor: Dr. M. Singh, Office: LB 915-7 (SGW), Phone: (514)848-2424, Ext. 4385
Email: murari.singh@concordia.ca

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 a proof of approval), such as **Sharp EL 531** or the **Casio FX 300MS**, available at the Concordia Bookstore, are permitted for the class test and final examination. See https://www.concordia.ca/content/dam/artsci/math-stats/docs/AppCalculatorList.pdf for a list of Approved and Not-Approved calculators.

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

If the grading scheme for this course includes graded assignments, a reasonable and representative subset of each assignment may be graded. Students will not be told in advance which subset of the assigned problems will be marked and should therefore attempt all assigned problems.

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) Mid-term test I will be held on **October 9, 2018** and the mid-term test II will be held on **November 8, 2018**. These exams, as well as the final, will be closed book exams.

3) Please note that there are **no supplemental privileges** in this course.

4) It is the Department's policy that tests missed for any reason, **including illness**, cannot be make up. If you miss the midterm tests **because of illness** (*medical note required*) the final exam will count 48% plus that missing midterm portions of your final grade, and the assignments will count for the remaining 12%.

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 $ß_0$ and $ß_1$; 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 **MID-TERM I**	Diagnostics for residuals; F-test for lack of fit. **MID-TERM I** will cover material up to section 3.7.
6	4.1, 4.2	Joint estimation of $ß_0$ and $ß_1$; simultaneous estimation of mean responses.
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, 5.10	Random vectors and matrices; differentiation of a vector and scalar function of n x n matrix; simple linear regression model in matrix form. Least square estimation of regression parameters.
9	5.11, 5.12, 5.13 **MID-TERM II**	Fitted values and residual; ANOVA results; inferences in regression models. **MID-TERM II** will cover material section 4.1 to section 5.13.
10	6.1, 6.2, 6.3	Multiple linear regression models; general linear regression model in matrix terms; estimation of regression coefficients.
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.

Academic Integrity and the Academic Code of Conduct

This course is governed by Concordia University's policies on Academic Integrity and the Academic Code of Conduct as set forth in the Undergraduate Calendar and the Graduate Calendar. Students are expected to familiarize themselves with these policies and conduct themselves accordingly. "Concordia University has several resources available to students to better understand and uphold academic integrity. Concordia's website on academic integrity can be found at the following address, which also includes links to each Faculty and the School of Graduate Studies: concordia.ca/students/academic-integrity." *[Undergraduate Calendar, Sec 17.10.2]*