Lakehead University

Department of Mathematical Sciences

MATH-5331-FA – Advanced Topics in Statistics – Fall 2012

COURSE OUTLINE

Instructor: **Dr. Deli Li,   RB-2003, Ext. 8231,** dli@sleet.lakeheadu.ca

Description: This one semester course will explore various advanced topics in statistics such as linear regression analysis, design of experiments, etc.

Prerequisite: Students should be comfortable with probability and statistics at the level of MATH 2331 and MATH 2333.

Textbooks: Two textbooks are as follows

>   **Book 1**.   Introduction to Linear Regression Analysis 3rd Edition by D. C. Montgomery, E. A. Peck, and G. G. Vining
>   **Book 2**.   Fundamental Concepts in the Design of Experiments by C. R. Hicks and K. V. Turner, Jr.

Content: Topics may include:

- Simple linear regression
- Multiple linear regression
- Model Adequacy checking
- Polynomial regression models
- Indicator variables
- Variable selection and model building
- Completely randomized designs
- Treatment comparisons
- Factorial designs and interactions;
- Power analysis;
- Fixed and random effects models;
- Balanced incomplete block designs;
- Latin squares and split plot designs;
- Hierarchical (nested) designs;
- Repeated measures designs.

<u>Lectures:</u>   **Tuesday & Thursday 1:00 p.m. - 2:30 p.m. in RB-1023.**

<u>Office Hours:</u>   **Monday & Wednesday 10:00 a.m. - 12:00 p.m. or by appointment.**
For an appointment, please email the instructor.

Course Requirements:

Assignments: A list of assignment problems will be given to students during the Thursday class period and are due on the Friday in the following week. Late assignments will not be marked under any circumstances. Sloppy writing may face a mark penalty up to 20%. There will be approximately 6 assignments worth 20% of your final mark. Each student's lowest assignment mark will be dropped for the final mark calculation.

Midterm Exam: The midterm exam will be written in RB-1023 on Tuesday 16 October 2012. No make-up test is provided for any student who misses writing the midterm exam at the scheduled time. If there is a legitimate (documented) excuse, the final mark will be calculated on the basis of the final exam. Otherwise, a grade of 0% for the missed exam will be averaged with other grades.

Final Exam: The final exam will be written in the scheduled three hours. Further details will be provided closer to the exam date.

<u>Note:</u> Exams will be open book and a non-programmable calculator is allowed.

Determination of Final Marks:

The basic formula is as follows

Assignments:	**20%**
Attendance:	**10%**
Midterm Exam:	**20%**
Final Exam:	**50%**

Marking Disputes: If you feel you have been treated unfairly in the marking of the midterm exam or an assignment, put your complaint in writing on the front of the paper and return it to the instructor.

Drop Date: The final date to withdraw from this course without academic penalty is Friday 02 November 2012.

Academic Dishonesty: All cases of academic dishonesty will be dealt with according to the University's Code of Student Behaviour and Disciplinary Procedures, copies of which are available from the Registrar.