

ANALYSIS OF EXPERIMENTAL AND OBSERVATIONAL DATA (3)

Class Number: 3964 Delivery Method: In Person

COURSE TIMES + LOCATION:

Tu 11:30 AM – 1:20 PM
SSCB 9200, Burnaby

Th 11:30 AM – 12:20 PM
SSCB 9200, Burnaby

EXAM TIMES + LOCATION:

Feb 10, 2020
6:00 PM – 8:00 PM
SSCC 9001, Burnaby

Mar 16, 2020
6:00 PM – 8:00 PM
SSCC 9001, Burnaby

Apr 19, 2020
3:30 PM – 6:30 PM
TAKE HOME-EXAM, Burnaby

INSTRUCTOR:

Marie Loughin
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Office: SC-K10552

PREREQUISITES:

One of STAT 201, STAT 203, STAT 205, STAT 270, or BUEC 232.

Description

CALENDAR DESCRIPTION:

The standard techniques of multiple regression analysis, analysis of variance, and analysis of covariance, and their role in observational and experimental studies. This course may not be used to satisfy the upper division requirements of the Statistics major or honours program. Quantitative.

COURSE DETAILS:

Lab Instructor: Marie Loughin

Course Outline:

This upper division course introduces students to modelling relationships between a quantitative response variable and both quantitative and categorical explanatory variables. Students will be given the opportunity to practice through the analysis of data provided by the instructor. Students will also work in groups to test their own hypotheses, first collecting data from a simulated population, then using course methodologies to analyze the data, and finally interpreting the results of the analysis in the context of their hypotheses.

R will be used for analysis, using either the Jupyter online platform or RStudio downloaded (free) to a computer. R is available on all computers in SFU's computer labs. Drop-in help for course concepts and assignments, including use of R, is available through the Statistics Workshop.

iClickers will be used in class. Bonus marks will be given for iClicker participation.

1. **Review:** Important concepts from the first course in statistics will be reviewed in the context of statistical models.
2. **Simple linear regression (SLR):** models summarizing the relationship between two quantitative variables. This includes the estimation and interpretation of model parameters, assessment of the model's fit, inference, and prediction.
3. **Multiple regression:** constructing models in which several explanatory variables combine to help explain the variability in a quantitative response variable. This includes model assessment, comparison of two regression lines, interactions between explanatory variables, and multicollinearity. Additional topics may include identifying unusual points, variable selection, and/or coding categorical predictors.
4. **Analysis of variance (ANOVA):** Use of models to compare means of a quantitative response variable between groups defined by a categorical explanatory variable (e.g. a treatment variable). Includes model assessment and inference for comparison of means. If time allows, other topics in ANOVA may be included, such as analysis of covariance, tests for homogeneity of variances, the problem of multiple testing and/or block designs.

M will take place in the of the dates provided below

Grading

Concept quizzes	s	2%
Class Participation		3%
Assignments (individual and group)		20%
Midterm 1-Feb 10, 18:00-20:00, B9200/B9201		15%
Midterm 2-Mar 16, 18:00-20:00, B9200/B9201		20%
Final		40%

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M

F

Tutor Requests:

Students looking for a Tutor should visit <http://www.stat.sfu.ca/teaching/need-a-tutor-.html>. We accept no responsibility for the consequences of any actions taken related to tutors.

REGISTRAR NOTES:

SFU's Academic Integrity web site <http://www.sfu.ca/students/academicintegrity.html> is filled with information on what is meant by academic dishonesty, where you can find resources to help with your studies and the consequences of cheating. Check out the site for more information and videos that help explain the issues in plain English.

Each student is responsible for his or her conduct as it affects the University community. Academic dishonesty, in whatever form, is ultimately destructive of the values of the University. Furthermore, it is unfair and discouraging to all students who study honestly.