

SPRING 2018 - STAT 302 D100

# ANALYSIS OF EXPERIMENTAL AND OBSERVATIONAL DATA (3)

Class Number: 4403 Delivery Method: In Person

## Overview

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**COURSE TIMES + LOCATION:**Th 2:30 PM – 3:20 PM  
DFA 300, BurnabyTu 2:30 PM – 4:20 PM  
DFA 300, Burnaby**EXAM TIME + LOCATION:**Apr 17, 2018  
Tue 8:30 AM – 11:30 AM  
Location: GYM CENTRAL, Burnaby**INSTRUCTOR:**Loughin, Marie  
[mloughin@sfu.ca](mailto:mloughin@sfu.ca)  
778.782.3147  
Office: SC-K10552**PREREQUISITES:**

Any STAT course (except STAT 100), or BUEC 232, or ARCH 376. Statistics major and honors students may not use this course to satisfy the required number of elective units of upper division statistics. However, they may include the course to satisfy the total number of required units of upper division credit.

## Description

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**CALENDAR DESCRIPTION:**

The standard techniques of multiple regression analysis, analysis of variance, and analysis of covariance, and their role in experimental research. Quantitative

**COURSE DETAILS:****Lab Instructor: Marie Loughin****Course Outline:****TOPICS****1. Introduction to Regression Analysis**

Simple regression, regression and causality, assumptions of linear regression, measuring adequacy of assumptions, estimation of error variance, inferences concerning slope and intercept, inferences concerning the simple regression line, interpretation of estimated regression lines, prediction with regression line.

**2. Correlation and its Relationship to Regression**

Definition of the correlation coefficient,  $R$ , measures of association, the bivariate normal distribution, what  $R$  does not measure, estimation and testing with  $R$ .

**3. Analysis of Variance**

One- and two-way analysis of variance, the analysis of variance table and related tests, fixed and random effects, multiple comparison procedures and contrasts.

**4. Multiple Regression Analysis**

Using more than one independent variable, graphical considerations for this problem, assumptions, collinearity, estimation of the best regression equation, analysis of variance table, overall and partial  $F$  tests.

**5. The General Linear Model**

Multiple regression and analysis of variance as special cases of the general linear model. The general procedure for constructing  $F$ -tests by fitting restricted models. Applications to analysis of covariance and comparison of two regression models.

**6. Correlations: Multiple, Partial and Multiple-Partial**

Correlation matrix, multiple correlation coefficient, the multivariate normal distribution, partial correlation coefficient, F-tests for multiple and partial correlations.

**7. Analysis of Residuals**

Checking the assumptions of the regression and analysis of variance models, effects of departures from the assumptions, transformations of the response and predictor variables.

## Grading

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Class Participation	5
Assignments	12
Midterms	30
Final	53

## NOTES:

***Above grading is subject to change.***

## Materials

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## REQUIRED READING:

**STAT2: Building Models for a World of Data.** Author: Ann R. Cannon. Publisher: Freeman ISBN: 978-1-4641-5047-0

## RECOMMENDED READING:

## DEPARTMENT UNDERGRADUATE NOTES:

**Students with Disabilities:**

Students requiring accommodations as a result of disability must contact the Centre for Students with Disabilities 778-782-3112 or [csdo@sfu.ca](mailto:csdo@sfu.ca)

**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://students.sfu.ca/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 the majority of students who pursue their studies honestly. Scholarly integrity is required of all members of the University. <http://www.sfu.ca/policies/gazette/student/s10-01.html>

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## MODIFIED BY:

Department, Statistics Actuarial (stat) on 2017-11-22 11:58 AM

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