

SPRING 2019 - STAT 604 G100

**ANALYSIS OF EXPERIMENTAL AND OBSERVATIONAL DATA (3)**

Class Number: 3470 Delivery Method: In Person

**COURSE TIMES + LOCATION:**Tu 11:30 AM – 1:20 PM  
SSCB 9200, BurnabyTh 11:30 AM – 12:20 PM  
SSCB 9200, Burnaby**EXAM TIMES + LOCATION:**Apr 16, 2019  
12:00 PM – 3:00 PM  
RCB IMAGTH, Burnaby**INSTRUCTOR:**

Jorge Rodriguez

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Office: AQ 5069

Office Hours: Tuesdays 1:30-2:30 Except: Jan 29, Feb 26, Mar 26

**PREREQUISITES:**

Any course in Statistics. Open only to students in departments other than Statistics and Actuarial Science.

## Description

**CALENDAR DESCRIPTION:**

The standard techniques of multiple regression analysis, analysis of variance, and analysis of covariance, and their role in experimental research. Students with credit for STAT 302 may not take this course for further credit.

**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

Participation	5%
Assignments	15%
Midterms	30%
Final Exam	50%

### NOTES:

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

## Materials

### MATERIALS + SUPPLIES:

**R can be accessed via Jupyter, an online platform, at <https://sfu.syzygy.ca/>. Alternatively, R Studio and R statistical software can be downloaded free of charge from <https://www.rstudio.com/> and <https://cran.r-project.org/>, respectively.**

### REQUIRED READING:

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

### GRADUATE STUDIES NOTES:

Important dates and deadlines for graduate students are found here: [http://www.sfu.ca/dean-gradstudies/current/important\\_dates/guidelines.html](http://www.sfu.ca/dean-gradstudies/current/important_dates/guidelines.html). The deadline to drop a course with a 100% refund is the end of week 2. The deadline to drop with no notation on your transcript is the end of week 3.

### REGISTRAR NOTES:

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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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