

ANALYSIS OF EXPERIMENTAL AND OBSERVATIONAL DATA (3)

Class Number: 2648 Delivery Method: In Person

Tu 2:30 PM – 4:20 PM
RCB IMAGTH, Burnaby

Aug 16, 2019
12:00 PM – 3:00 PM
SSCC 9001, Burnaby

Th 2:30 PM – 3:20 PM
RCB IMAGTH, Burnaby

Michael Davis
jackd@sfu.ca
Office: SC-P9316

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

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.

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.

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

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.

ž

STAé
