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# ANALYSIS OF EXPERIMENTAL AND OBSERVATIONAL DATA (3)

**Class Number: 4403** **Delivery Method: In Person**

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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**EXAMTIME + 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.

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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**

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