Students requiring accommodations as a result of disability, must contact the Centre for Students with Disabilities 778-782-3112 or csdo@sfu.ca

Instructor: Dr. Tom Loughin (Surrey)

Prerequisite:

STAT 285 and MATH 251

Textbook:

Applied Linear Statistical Models, 5th ed. by Kutner, Nachtsteim, Neter, Li; Publisher McGraw-Hill/Irwin

Calendar Description:

Theory and application of linear regression. Normal distribution theory. Hypothesis tests and confidence intervals. Model selection. Model diagnostics. Introduction to weighted least squares and generalized linear models. **Quantitative**

Outline:

1. Linear models: Definition, simple and multiple linear regression models, ANOVA models. Incorporating different types of predictor variables and their interactions in the model. Matrix notation.
2. Estimation methods: Least-squares, maximum likelihood. Algebraic and geometrical interpretations.
3. Properties of least-squares estimators: Mean, variance, and covariance of least-squares estimators. Expected value of residual sum of squares.
4. Diagnostic tools: Residual plots, multicollinearity, outliers, influential observations, goodness-of-fit tests.
5. Inference: Interpretation of the parameter estimates. Hypothesis tests, p-values, confidence intervals, prediction and intervals. Inferences for a linear function of the regression coefficients.
6. General Linear Hypotheses: Additional sum of squares principle. Test for lack of fit based on the pure error sum of squares.
7.