



Statistics 429 Applied Linear Regression

(see Course Descriptions under the year applicable: http://www.ucalgary.ca/pubs/calendar/)

Table with 3 columns: Topics, Syllabus, and Number of hours. Topics include R basics, simple linear regression, factor coding, vector and matrix algebra, multiple linear regression, regression diagnostics, polynomial regression, variable selection, and other regression models. Total hours: 36.

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University of Calgary

STAT 429 – Applied Linear Regression

Course Learning Outcomes

This course is designed to provide students with the opportunity to obtain comprehensive understanding of linear regression and how to use it as a vital research tool to explore the relationship between variables. It details the application of simple linear regression and its generalization to multiple linear regression, provides hands-on experience to use statistical software to fit model and gives an overview of various regression types. By the end of this course, students should be able to:

- understand the different types of regression and identify the applicable model to adopt for the investigation of the association between a response variable and one or more predictors
- fully explore the latent relationships between variables and construct linear regression model with both continuous and categorical predictors via the method of least squares
- list the assumptions underlying linear regression model, evaluate the validity and goodness of fit of the fitted model using graphical and numerical methods, and carry out variable selection when needed
- conduct regression coefficient and error variance estimation, interpret the model parameters, carry out hypothesis testing and draw valid statistical inferences based on the sampling distribution of the parameter estimates
- use the proposed model to estimate means and predict individual responses, and derive confidence intervals for the estimates and predictions
- identify and diagnose potential problems with linear regression models such as violations of model assumptions and existence of outliers, influential points and collinearity and follow the procedures to address these issues
- add interactions to regression model and use variable transformation to integrate non-additive and non-linear relationships and make reliable inferences based on the new model
- use statistical software to conduct legitimate linear regression, extract and decipher the desired outputs, communicate the findings with general audience in a professional and effective manor, and provide constructive comments to peers

Date: August 2017 Creator: HS