Instructor: Dr. Jiguo Cao

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. -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. Model selection: Effect of the question of interest on the choice of model, difficulties in model selection due to multicollinearity. Automatic variable selection procedures, warnings and recommendation
8. Special methods for ANOVA models: Linear constraints. Factor and interaction plots. Multiple comparison procedures
9. Introduction to weighted least squares and generalized linear models.

Grading Scheme:

Assignments – 15 %
Project– 20 %
Final Exam – 65 %
Grading is subject to change

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