MATH 337/533
Applied Regression and Time Series Analysis (4 units)

Course Outline

Topics	# of Weeks
A short review of basic statistic (Chapter 1)	0.3
Simple linear Regression (Chapter 3.1 – 3.8) (Simple linear regression model, least squares estimates, inference for regression parameters, inference for correlation coefficient)	2.0
Multiple Linear Regression (Chapter 4.1 – 4.10) (Multiple regression model, least squares estimate using matrix algebra, adjusted coefficient of multiple determination, overall F-test, confidence and prediction intervals, Interaction, and dummy variables)	2.0
Model Building and Residual Analysis (Chapter 5.1 – 5.4) Residual analysis for assessing validity of model assumptions in multiple regression, model building and the effect of multicollinearity, Influential observations)	1.3
Time Series Regression (Chapter 6.1 – 6.3 and, Chapter 6.4 – 6.6 if time permits) Modeling Trend by using polynomial function, Detecting autocorrelation, and types of seasonal variation)	1.7
Non Seasonal Box-Jenkins Models (Chapter 9.1 – 9.4) Stationary and nonstationary time series, Autocorrelation functions, Autoregressive (AR) and moving average (MA) models, forecasting)	2.0
Inference and Diagnostic Checking for Nonseasonal Box-Jenkins Models (Chapter 10.1 – 10.5) Stationary and inevitability conditions, Diagnostic Checking, forecasting	2.0
Box-Jenkins Seasonal Modeling (Chapter 11.1 – 11.3) Transforming a seasonal time series into a stationary time series, examples	1.7
Exponential Smoothing (Chapter 8.1 – 8.3, if time permits) Simple exponential smoothing, tracking signals, Hold's trend corrected exponential smoothing	
Tests	1.0

Textbook: Forecasting, Time Series, and Regression 4th Edition by Bowerman, O'Connell, and Koehler

Revised: Fall 2007