

**Instructor**

Robert Stine

444 Huntsman Hall

898-3114

stine@wharton

Overview

This course explores the use of the statistical method known as regression analysis for the study of problems in business, economics and the sciences. Regression analysis is perhaps the most important and heavily used collection of statistical methods. Its popularity arises from its ability to “explain” variation, find patterns, and make predictions. Students should be familiar with the key ideas covered in Statistics 101. These foundations include data displays (boxplots, histograms, quantile plots, and scatterplots), summary statistics (such as the mean, standard deviation, and correlation), and basic properties of statistical estimates and tests (including standard error, confidence intervals, p-values). The first weeks of the course review these notions, focusing on applications and assumptions. If you need to refresh your knowledge, consult materials from Stat 101 and your textbook.

At each class, I expect that you will have read the assigned portions of the textbook. Classes will focus on critical interpretation of results and analysis of assumptions. The software JMP does the computations, but it will be up to you to identify an appropriate approach and to interpret results. The software itself is not a main focus of the course.

Grading

Your grade for the course is derived from **six in-class quizzes** (25% total, best 5 of the 6 offered), **two mid-term exams** (20% each), and the **final examination** (35%). Exercises from the text will be recommended but not collected.

Texts and Software

Stine and Foster, *Statistics for Business: Decision Making and Analysis, Second Edition*. Pearson.

JMP, Version 11 or 12

Teaching Assistants

Office hours for teaching assistants will be posted at the start of the semester.

Planned schedule of lectures, quizzes and exams

Follows on the next page.

Date	Topic	Reading	Quiz
Aug 27	Overview, variation in data	Ch 3-6, 11-12	
Sep 1	Standard error, Central Limit Theorem	Ch 13-14	
Sep 3	Confidence intervals and tests	Ch 15-16	
Sep 8	Comparison and chi-square	Ch 17-18	
Sep 10	Pairing, association, and design	Ch 6, 17	Quiz 1
Sep 15	Linear patterns	Ch 19	
Sep 17	Residual analysis	Ch 19	
Sep 22	Data transformations	Ch 20	
Sep 24	Curved patterns	Ch 20	Quiz 2
Sep 29	The Simple Regression Model	Ch 21	
Oct 1	Mid-term review Mid-term Exam 6-8 pm		Midterm 1
Oct 6	Inference and prediction in the SRM	Ch 21	
Oct 8	Fall Break		
Oct 13	Regression diagnostics	Ch 22	
Oct 15	Dependence and time series	Ch 22, 27	
Oct 20	The Multiple Regression Model	Ch 23	Quiz 3
Oct 22	Inference in multiple regression	Ch 23	
Oct 27	Collinearity in multiple regression	Ch 24	Quiz 4
Oct 29	Building regression models	Ch 24	
Nov 3	Categorical variables in regression	Ch 25	
Nov 5	Mid-term review Mid-term Exam 6-8 pm		Midterm 2
Nov 10	Interactions in regression	Ch 25	
Nov 12	More complex categorical features	Ch 25	
Nov 17	Data mining with regression	SIA p767	Quiz 5
Nov 19	Forecasting with regression	Ch 27	
Nov 24	Models for time series	Ch 27	Quiz 6
Nov 26	Thanksgiving holiday		
Dec 1	Categorical responses in regression	Handout	
Dec 3	Logistic regression	Handout	
Dec 8	Final review		
Dec 11	Final Exam, 6-8 pm		