Course Learning Objectives: This course presents some model building techniques within the context of basic business statistics.

- Construct and interpret regression and some simple time series models of a response variable according to specified predictor variables that contribute to estimating the unknown value of the response variable as a conditional mean.

- Do all statistical analyses introduced in the course using the computer and read and interpret the resulting output.

It is possible to teach at the purely mechanical level, what is sometimes referred to as “cookbook teaching”. More useful is an understanding of the logical and conceptual basis of an analysis. This understanding provides the analyst with enhanced ability to intelligently apply the technique, to further understand the meaning of the technique as well as its inherent limitations, to better position the technique against alternative procedures and to understand which procedure to select, and to provide a more comprehensive background to pursue further learning.

Text: D. W. Gerbing (2014), *R Data Analysis without Programming*, NY: Rutledge. Chapters 8 through 10 explain much of the material for the first four weeks of this course.

Computer Analyses. Use whatever tools you wish, of which one option is my *lessR* data analysis routines that run as *R* functions and which I use during class. This class will also use the *lessR* function *Regression* plus some standard *R* Time Series functions.

Homework: The Final is directly and literally built from the homework problems, so the ability to do the homework problems is the key indicator of doing well on the tests. Weekly homework is posted under the relevant week listed on the home page of the course website.

Homework is considered a learning experience, and so is not graded for correctness. Full solutions are provided after each week’s homework is turned in. It is your responsibility to assess the quality of your homework from the solutions. If you have questions remaining after studying the posted solutions, make sure that those questions get answered. Consistent with this conceptualization, you can work on the homework as a group if that facilitates your learning, and turn in the homework as a group in the D2L Dropbox. Do, however, put everyone’s name on the homework as well as in the note section of the Dropbox when turned in.

Tests: The tests are to be done individually. The final consists of two parts and both parts are open book. Answer computer analysis and interpretation problems as a take home with all class materials and the Internet available as resources, with the sole resource constraint that you work alone, not consulting other people with help answering the questions. The analysis problems on the take-home tests are close copies of the homework problems with different data sets.
The second part of the final addresses more conceptual issues with short answer questions administered by D2L under a time limit. Class materials and outside resources can still be consulted, but the time limit requires general knowledge regarding these questions before attempting the test. The general concepts to be tested on the short answer part of the Final are listed as part of each week’s homework assignment.

Students who do well on both parts of the Final and the homework earn an “A” in the course. In practice, students who do not achieve an “A” usually do less well on the conceptual, short-answer questions. To formalize this distinction, choose one of two grade tracks.

Track A: Take both forms of the Final and be eligible for an A in the course.

Track B: Ignore the short-answer part of the exams. Instead, just demonstrate the ability to “do” statistics by interpreting output without necessarily gaining a more in-depth conceptual understanding of the underlying principles. Maximum course grade for this track is a B.

Course Grade: Your course percentage is weighted .10 of homework and .90 of the Final. The two parts of the Final are weighted .5 each in the assessment of the grade on the Final, so each part of the Final is effectively .45 of the final course percentage.

Your course percentage directly translates into a letter grade, depending on your selected track. This table lists the minimum cutoffs of your course % for each letter grade.

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The cutoffs may be lowered to your favor, but these are the minimum guarantees.

ISQA 515 Topic Outline

These dates are assignment dates. The due date for each homework is the following week, due at the beginning of each class period.

Week 1 [01/09] Correlation and Bivariate Regression

Week 2 [01/16] Model Fit, Introduction to Multiple Regression

Week 3 [01/23] Collinearity, Model Selection, Prediction, Outliers

Week 4 [01/30] Autocorrelation, Seasonality, Introduction to Time Series

Final [02/06] Optional Short Answer administered via D2L, Take-Home due at the end of the week