

# STA371G

## Statistics and Modeling

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T Th 2.00p-3.30p (Unique 04455)

T Th 3.30p-5.00p (Unique 04460)

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### Course description

This course introduces some of the basic concepts in quantitative business analysis. We discuss methods that are used extensively in business organizations to solve large, structured problems. Such methods generate results that support decision-making at all levels of the organization over various time horizons.

The primary topics we will cover in this class are statistical regression, time series analysis & forecasting, decision analysis and simulation. We will repeatedly use real world datasets and examples to motivate our discussions and illustrate the relevance of what you learn. The concepts and methods you learn in this class should improve your own general problem solving skills. By the end of the semester you will have learned concepts and tools that will help you analyze, infer and make decisions using quantitative data.

### Textbook

The textbook for the course is Albright, S. C., W. L. Winston, C. Zappe. "Data Analysis and Decision Making with Microsoft Excel". You can use the fourth or the extended third (3e) edition. Class lectures will not rely on the book very much. However, the book will serve well as a companion reading material and give you more sample problems and exercises.

### Course material and web page

Course announcements, syllabus, assignment due dates, solutions, lecture slides, videos and other course material will be posted on the class webpage: <http://bit.ly/f13sta371g> (case sensitive). Blackboard (courses.utexas.edu) will be used to administer assignments, tests and to report grades. There will be a link to the class webpage from Blackboard as well.

### Homework

Weekly assignments will be posted on Blackboard on Wednesdays starting 4<sup>th</sup> Sept. Answers are to be submitted on Blackboard by midnight on their due date, which will be one week from the posted date. Excel worksheet that shows your work should also be uploaded to get credit. Please do not wait until the last minute to submit. This will allow for any unexpected difficulties (with the material, Blackboard, etc.), which occur much more frequently than one would expect. Your lowest homework score will be dropped in calculating the aggregate grade. Assignments are to be completed individually and not in teams.

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#### Instructor:

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Office Hrs: Tue 5p-7p

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#### Teaching Assistant:

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Office Hrs: Wed 1p-3p

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## Exams

There will be one midterm test and one final. All tests will be given in the MOD Lab. All material presented in class will be included.

## Computing

This is a very quantitative course and there will be substantial numerical calculations. We will use Microsoft Excel and some software tools installed on it. For the sake of consistency we will stick to Excel 2010 on Windows for demonstrations. Also note that this is the setup that will be available to you at the MOD lab during your tests. There will be a number of excel demonstrations in class. It is not necessary to have your laptops during these times. While you are allowed to follow these demonstrations with your laptop, please be aware that I cannot stop to answer debugging questions (we will have to do this during office hours). Moreover, videos of many of these demonstrations will be posted.

## Tentative schedule

### Grading:

Each test will account for 40% of your final grade. All homework assignments together will account for the other 20%. Plus and minus grades will be used in assigning final grades.

### Quantitative Reasoning flag:

Note that this course also carries the Quantitative Reasoning flag ([utexas.edu/ugs/teaching/flags](http://utexas.edu/ugs/teaching/flags)). Quantitative Reasoning courses are designed to equip you with skills that are necessary for understanding the types of quantitative arguments you will regularly encounter in your adult and professional life.

Lecture	Date	Topic	Subtopic
1	29-Aug	Introduction	Syllabus, introductions and course overview
2	3-Sep	"	Review - Confidence intervals
3	5-Sep	Regression	Review - Hypothesis testing
4	10-Sep	"	Correlations and covariance
5	12-Sep	"	Simple linear regression
6	17-Sep	"	Measuring goodness of fit
7	19-Sep	"	Multiple regression and inference
8	24-Sep	"	Multiple regression and inference continued
9	26-Sep	"	Dummy variables, Multicollinearity and the Anova table
10	1-Oct	"	Model selection
11	3-Oct	Time series & forecasting	Time series components, forecasting errors
12	8-Oct	"	Forecasts using one variable, moving averages, smoothing
13	10-Oct	"	Forecasts using regression, trends and autocorrelations
14	15-Oct	"	Seasonality
15	17-Oct	Mid term review	<i>Mid term at the MOD lab in the evening</i>
16	22-Oct	Decision Analysis	Review of probability and distributions
17	24-Oct	"	Introduction to decision trees and Precision Tree
18	29-Oct	"	Sensitivity analysis and Bayes Rule
19	31-Oct	"	Multistage problems
20	5-Nov	"	Value of information and Risk
21	7-Nov	Simulation	Introduction to simulation and @Risk
22	12-Nov	"	Running multiple simulation runs
23	14-Nov	"	Output distribution summaries
24	19-Nov	"	Multiple sources of randomness and correlation
25	21-Nov	"	Simulation models
26	26-Nov	"	Simulation models continued
27	3-Dec	Finals review	<i>Finals at the MOD lab during the assigned finals time</i>
28	5-Dec	Course summary	Course summary and final review

## Scholastic dishonesty

The McCombs School of Business has no tolerance for acts of scholastic dishonesty. The responsibilities of both students and faculty with regard to scholastic dishonesty are described in detail in the Policy Statement on Scholastic Dishonesty for the McCombs School of Business. By teaching this course, I have agreed to observe all the faculty responsibilities described in that document. By enrolling in this class, you have agreed to observe all the student responsibilities described in that document. If the application of that Policy Statement to this class and its assignments are unclear in any way, it is your responsibility to ask me for clarification. Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. You should refer to the Student Judicial Services website at <http://deanofstudents.utexas.edu/sjs/> or the *General Information Catalog* to access the official University policies and procedures on scholastic dishonesty as well as further elaboration on what constitutes scholastic dishonesty.

Scholastic dishonesty in this course includes copying or collaborating during an exam, discussing or divulging the contents of an exam with another student who will take the test, and use of homework solutions from another student or semester.

## Students with disabilities

The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. This includes students with ADHD and learning disabilities. For more information, contact the Division of Diversity and Community Engagement, Services for Students with Disabilities: <http://www.utexas.edu/diversity/ddce/ssd/> or at 471-6259, 471-4641 TTY.