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## Syllabus

### Course Information

This course focuses on the application of data analytic, quantitative tools in business decisions. We will start with a quick review of basic statistics topics followed by regression models. Students will learn how to use regression to analyze a variety of complex real world problems. Numerous empirical examples from finance, marketing, economics, politics, sports, etc are used to illustrate applications of the material covered. Emphasis will be placed on analysis of actual datasets. Topics covered include: (i) simple linear regression; (ii) multiple regression; (iii) prediction; (iv) residual diagnostics; (v) time series forecasting; (vi) logistics regression; (vii) simulation and (viii) decision trees.

### Course Website

<http://www.mcombs.utexas.edu/faculty/carlos.carvalho/teaching/>

### Texts/Notes

There is no course pack or required textbook for the class. All lecture notes and course materials will be available in the class website. Some students find having a supplemental text useful for studying. I recommend the textbook *Data Analysis and Decision Making with Microsoft Excel*, by Albright, Wiston and Zappe. An Excel add-in associated with this book will also be used in the second part of the course so **I suggest reading the chapters covering the class material.**

### Evaluation

Your final grade will be assigned in the following way:

**Homeworks.....10%**  
**Midterm 1.....25%**  
**Midterm 2.....25%**  
**Take-Home Final Exam...40%**

**Homework assignments** will be bi-weekly (approximately). Students are encouraged to form groups to do homework and only one write-up per group needs to be turned in. The maximum group size is 4. Late homework assignments will not be accepted. Hard copies of homework assignments should be submitted in class and should have a **clear and professional** presentation. Homeworks will be graded on a pass/fail basis.

**Midterm1** will be in class on Wed October 6. It will be graded on a 0-100 scale.

**Midterm 2** will be in class on Wed November 10. It will be graded on a 0-100 scale.

The **Take-Home Final Exam** is individual and will be due on Friday Dec 3<sup>rd</sup> (Last day of classes). It will be graded on a 0-100 scale.

It is expected that students will complete all assignments and exams for the course. **No request for rescheduling will be entertained.**

There is no predetermined grade distribution for this class. However, the faculty at McCombs has recommended a GPA of  $3.33 \pm 0.05$ . Historically, this course has been fairly close to the recommended GPA, but we reserve the right to deviate.

You will not be graded on attendance or participation.

### **Request for Regrade**

Clerical errors will be corrected without hassle. Other regrading requests must be submitted in writing within one week (7 days) of the exam's return. Keep in mind that the entire exam will be subject to regrading.

### **Office Hours**

Office hours: Monday and Wednesday 5-6:30pm.

I am also happy to meet with anyone that wants to schedule an appointment. The best way to contact me is through email. I will be available for meetings on Mondays, Tuesdays and Wednesdays. Finally, feel free to call my office if you have any questions. My office number is (512) 471-5823.

### **Class Handouts**

You are responsible for bringing the relevant section of the lecture notes to every lecture. All course materials are available on the web.

## Class Schedule

Class 1: August 25	Introduction and a First Regression Example
Class 2: August 30	Random Variables, Probability Distributions, The Normal Distribution
Class 3: September 1	Estimation of Means and Variances
Class 4: September 8	Sampling Distributions
Class 5: September 13	Central Limit Theorem and Review
Class 6: September 15	Relating X to Y; Intro to Simple Linear Regression
Class 7: September 20	Least Squares and its Properties
Class 8: September 22	The SLR Model
Class 9: September 27	Inference on the SLR Model (1)
Class 10: September 29	Inference on the SLR Model (2)
Class 11: October 4	Review
Class 12: October 6	<b>Midterm 1</b>
Class 13: October 11	Multiple Linear Regression (1)
Class 14: October 13	Multiple Linear Regression (2)
Class 15: October 18	Residual Diagnostics/Transformations
Class 16: October 20	Interactions and Dummy Variables
Class 17: October 25	Model Selection
Class 18: October 27	Time Series
Class 19: November 1	Logistic Regression
Class 20: November 3	Decision Analysis and Decision Trees (1)
Class 21: November 8	Decision Analysis and Decision Trees (1)
Class 22: November 10	<b>Midterm 2</b>
Class 23: November 15	Sensitivity Analysis
Class 24: November 17	Expected Value of Information
Class 25: November 22	Monte Carlo Simulation (1)
Class 26: November 24	Monte Carlo Simulation (2)
Class 27: November 29	Assessing Risk with Simulation Models (1)
Class 28: December 1	Assessing Risk with Simulation Models (2)

## **McCombs Classroom Professionalism Policy**

The highest professional standards are expected of all members of the McCombs community. The collective class reputation and the value of the McCombs experience hinges on this.

Faculty are expected to be professional and prepared to deliver value for each and every class session. Students are expected to be professional in all respects.

The classroom experience is enhanced when:

- **Students arrive on time.** On time arrival ensures that classes are able to start and finish at the scheduled time and enhances learning by reducing avoidable distractions.
- **Students are fully prepared for each class.** Much of the learning in the program takes place during classroom discussions. When students are not prepared they cannot contribute to the overall learning process. This affects not only the individual, but their peers who count on them, as well.
- **Students respect the views and opinions of their colleagues.** Disagreement and debate are encouraged. Intolerance for the views of others is unacceptable.
- **Phones and wireless devices are turned off.** Please be sure to turn off your phones and wireless devices before class begins.

## **Academic Dishonesty**

I have no tolerance for acts of academic dishonesty. Such acts damage the reputation of the school and the degree and demean the honest efforts of the majority of students. The minimum penalty for an act of academic dishonesty will be a zero for that assignment or exam.

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 enrolling in this class, you have agreed to observe all of the student responsibilities described in that document. By teaching this course, I have agreed to observe all of the faculty responsibilities described in that document. If the application of the Honor System to this class and its assignments is unclear in any way, it is your responsibility to ask me for clarification.

## **Students with Disabilities:**

Upon request, the University of Texas at Austin provides appropriate academic accommodations for qualified students with disabilities. Services for Students with Disabilities (SSD) are housed in the Office of the Dean of Students, located on the fourth floor of the Student Services Building. Information on how to register, downloadable forms, including guidelines for documentation, accommodation request letters, and releases of information are available online at <http://deanofstudents.utexas.edu/ssd/index.php>. Please do not hesitate to contact SSD at (512) 471-6259, VP: (512) 232-2937 or via e-mail if you have any questions.

## **Religious Holidays**

By UT Austin policy, you must notify me of your pending absence at least 14 days prior to the date of observance of a religious holiday. If you miss an exam you will be given an opportunity to complete the missed work within a reasonable time after the absence.

## **Honor Code Purpose**

Academic honor, trust and integrity are fundamental to The University of Texas at Austin McCombs School of Business community. They contribute directly to the quality of your education and reach far beyond the campus to your overall standing within the business community. The University of Texas at Austin McCombs School of Business Honor System promotes academic honor, trust and integrity throughout the Graduate School of Business. The Honor System relies upon The University of Texas Student Standards of Conduct (Chapter 11 of the Institutional Rules on Student Service and Activities) for enforcement, but promotes ideals that are higher than merely enforceable standards. Every student is responsible for understanding and abiding by the provisions of the Honor System and the University of Texas Student Standards of Conduct. The University expects all students to obey the law, show respect for other members of the university community, perform contractual obligations, maintain absolute integrity and the highest standard of individual honor in scholastic work, and observe the highest standards of conduct. Ignorance of the Honor System or The University of Texas Student Standards of Conduct is not an acceptable excuse for violations under any circumstances.

The effectiveness of the Honor System results solely from the wholehearted and uncompromising support of each member of the Graduate School of Business community. Each member must abide by the Honor System and must be intolerant of any violations. The system is only as effective as you make it.

## **Faculty Involvement in the Honor System**

The University of Texas at Austin McCombs School of Business Faculty's commitment to the Honor System is critical to its success. It is imperative that faculty make their expectations clear to all students. They must also respond to accusations of cheating or other misconduct by students in a timely, discrete and fair manner. We urge faculty members to promote awareness of the importance of integrity through in-class discussions and assignments throughout the semester.

## **Expectations under the Honor System**

### **Standards**

If a student is uncertain about the standards of conduct in a particular setting, he or she should ask the relevant faculty member for clarification to ensure his or her conduct falls within the expected scope of honor, trust and integrity as promoted by the Honor System. This applies to all tests, papers and group and individual work. Questions about appropriate behavior during the job search should be addressed to a professional member of the Career Services Office. Below are some of the specific examples of violations of the Honor System.

### **Lying**

Lying is any deliberate attempt to deceive another by stating an untruth, or by any direct form of communication to include the telling of a partial truth. Lying includes the use or omission of any information with the intent to deceive or mislead. Examples of lying include, but are not limited to, providing a false excuse for why a test was missed or presenting false information to a recruiter.

### **Stealing**

Stealing is wrongfully taking, obtaining, withholding, defacing or destroying any person's money, personal property, article or service, under any circumstances. Examples of stealing include, but

are not limited to, removing course material from the library or hiding it from others, removing material from another person's mail folder, securing for one's self unattended items such as calculators, books, book bags or other personal property. Another form of stealing is the duplication of copyrighted material beyond the reasonable bounds of "fair use." Defacing (e.g., "marking up" or highlighting) library books is also considered stealing, because, through a willful act, the value of another's property is decreased. (See the appendix for a detailed explanation of "fair use.")

### **Cheating**

Cheating is wrongfully and unfairly acting out of self-interest for personal gain by seeking or accepting an unauthorized advantage over one's peers. Examples include, but are not limited to, obtaining questions or answers to tests or quizzes, and getting assistance on case write-ups or other projects beyond what is authorized by the assigning instructor. It is also cheating to accept the benefit(s) of another person's theft(s) even if not actively sought. For instance, if one continues to be attentive to an overhead conversation about a test or case write-up even if initial exposure to such information was accidental and beyond the control of the student in question, one is also cheating. If a student overhears a conversation or any information that any faculty member might reasonably wish to withhold from the student, the student should inform the faculty member(s) of the information and circumstance under which it was overheard.

### **Actions Required for Responding to Suspected and Known Violations**

As stated, everyone must abide by the Honor System and be intolerant of violations. If you suspect a violation has occurred, you should first speak to the suspected violator in an attempt to determine if an infraction has taken place. If, after doing so, you still believe that a violation has occurred, you must tell the suspected violator that he or she must report himself or herself to the course professor or Associate Dean of the Graduate School of Business. If the individual fails to report himself or herself within 48 hours, it then becomes your obligation to report the infraction to the course professor or the Associate Dean of the Graduate School of Business. Remember that although you are not required by regulation to take any action, our Honor System is only as effective as you make it. If you remain silent when you suspect or know of a violation, you are approving of such dishonorable conduct as the community standard. You are thereby precipitating a repetition of such violations.

### **The Honor Pledge**

The University of Texas at Austin McCombs School of Business requires each enrolled student to adopt the Honor System. The Honor Pledge best describes the conduct promoted by the Honor System. It is as follows:

"I affirm that I belong to the honorable community of The University of Texas at Austin Graduate School of Business. I will not lie, cheat or steal, nor will I tolerate those who do."

"I pledge my full support to the Honor System. I agree to be bound at all times by the Honor System and understand that any violation may result in my dismissal from the Graduate School of Business."