



Professor	Jim Dyer
Office	CBA 3.218
Phone	512-471-5278
E-Mail	Jim.Dyer@mcombs.utexas.edu
Office hours	Tuesday and Thursday 4-5 or by appointment
Teaching Assistant	Ying He
TA e-mail	Ying.He@phd.mcombs.utexas.edu
TA Office Hours	Monday 2-5 in CBA 5.334C
Course Web Page	via Blackboard

This course introduces the techniques of Statistical Analysis, Decision Analysis and Simulation, and discusses their application to problems in Business. The techniques taught in the course will also be useful in performing analysis in most other BBA courses.

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. Secondly, these methodologies should improve your own problem solving skills. We stress an approach to problem solving that helps the decision-maker to (a) consider a richer set of alternatives, (b) understand and question assumptions, and (c) consider diverse measures of performance. The teaching approach will include lectures, skill-building exercises, and cases with the support of several software packages available on the PC in *Microsoft Excel*.

Course Objectives:

1. To develop your analytical problem solving skills.
2. To develop your case problem solving skills.
3. To strengthen your spreadsheet modeling skills.
4. To introduce you to five commonly used analytical problem solving techniques and their applications. In particular, we will cover correlation and regression, time series analysis and forecasting, decision analysis, simulation, and risk analysis.
5. To develop your skills in the use of spreadsheet-based software to support objective 4.

Evaluation:

Exam 1 (February 21)	20%
Exam 2 (April 2)	20%
Final Exam (Time to be announced)	20%
Homework (See course schedule for assignments and due dates)	25%
Case Exercises (See course schedule for cases and due dates)	15%

You may bring one 8½ × 11 inch page of notes and formulas (bring your calculator) to Exam 1, to Exam 2, and to the Final Exam. Examples of previous midterm test questions and previous final exam questions will be made available on the Blackboard course web site.

Homework (or skill-building exercises) will be assigned throughout the semester. Please hand in a very concise summary of your results for each exercise (e.g., an annotated spreadsheet containing your results). *Approximately half of the homework assignments will be graded on a 10 point scale. The other half will be graded for completion only (for a full 10 points). This will be determined on a random basis after the assignments are submitted. You may drop the lowest two homework problem grades over the semester. Each homework assignment is due in hard copy at the beginning of class. No late homework assignments will be accepted and no electronic submissions of assignments will be accepted.* If you encounter a grading problem on a homework exercise, please see the TA.

Three cases will be completed in self-selected groups of three or four people. Please form your case groups as soon as possible. If you have problems finding a group, please see me. No late case assignments will be accepted since solutions will be handed out or covered in class on the day they are due. If you encounter a grading problem on a case study, please see me. More specific instructions regarding each case will be provided during the semester.

Course Materials:

A special collection of chapters from Albright, S. C., W. L. Winston, C. Zappe. Data Analysis and Decision Making with Microsoft Excel, Fourth Edition is available at the Coop. This edition has only the chapters that we will use from the textbook, and therefore will save money for everyone.

A handout of the case studies will be available at the Coop early in the semester.

Computers and Communication devices

- By the nature of the material, I will be using a computer in every session. You are welcome to follow along with your personal computer. In addition, we will have some sessions in the MOD LAB as marked below with the detailed assignments.
- While the use of computers enhances the learning environment, they (as well as communications devices such as cellphones and iPods) can also be a distraction if used inappropriately. In particular, when students are surfing the web, checking and posting updates on Facebook and Twitter, responding to e-mail, instant messaging each other, and otherwise not devoting their full attention to the topic at hand they are doing themselves and their peers a major disservice. Those around them face additional distraction. Fellow students cannot benefit from the insights of the students who are not engaged. If you engage in behavior described above I will ask you to leave the classroom.

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 learning 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.
- **Phones and wireless devices are turned off.** Please be sure to turn off your phones and wireless devices before class begins.

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) is 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.

The following pages provide specific guidance about the Standard of Academic Integrity at the University of Texas at Austin. Please read it carefully and feel free to ask me any questions you might have. Excerpts from the University of Texas at Austin Office of the Dean of Students website (http://deanofstudents.utexas.edu/sjs/acint_student.php)

The Standard of Academic Integrity

A fundamental principle for any educational institution, academic integrity is highly valued and seriously regarded at The University of Texas at Austin, as emphasized in the standards of conduct. More specifically, you and other students are expected to "maintain absolute integrity and a high standard of individual honor in scholastic work" undertaken at the University ([Sec. 11-801](#), *Institutional Rules on Student Services and Activities*). This is a very basic expectation that is further reinforced by the University's [Honor Code](#). At a minimum, you should complete any assignments, exams, and other scholastic endeavors with the utmost honesty, which requires you to:

- acknowledge the contributions of other sources to your scholastic efforts;
- complete your assignments independently unless expressly authorized to seek or obtain assistance in preparing them;
- follow instructions for assignments and exams, and observe the standards of your academic discipline; and
- avoid engaging in any form of academic dishonesty on behalf of yourself or another student.

For the official policies on academic integrity and scholastic dishonesty, please refer to [Chapter 11](#) of the *Institutional Rules on Student Services and Activities*.

What is Scholastic Dishonesty?

In promoting a high standard of academic integrity, the University broadly defines scholastic dishonesty—basically, all conduct that violates this standard, including *any act designed to give an unfair or undeserved academic advantage*, such as:

- Cheating
- Plagiarism
- Unauthorized Collaboration
- Collusion
- Falsifying Academic Records
- Misrepresenting Facts (e.g., providing false information to postpone an exam, obtain an extended deadline for an assignment, or even gain an unearned financial benefit)
- Any other acts (or attempted acts) that violate the basic standard of academic integrity (e.g., multiple submissions—submitting essentially the same written assignment for two courses without authorization to do so)

Several types of scholastic dishonesty—[unauthorized collaboration](#), [plagiarism](#), and [multiple submissions](#)—are discussed in more detail on this Web site to correct common misperceptions about these particular offenses and suggest ways to avoid committing them.

For the University's official definition of scholastic dishonesty, see [Section 11-802](#), *Institutional Rules on Student Services and Activities*.

Unauthorized Collaboration

If you work with another person on an assignment for credit *without the instructor's permission to do so*, you are engaging in unauthorized collaboration.

- This common form of academic dishonesty can occur with all types of scholastic work—papers, homework, tests (take-home or in-class), lab reports, computer programming projects, or any other assignments to be submitted for credit.
- For the University's official definitions of unauthorized collaboration and the related offense of collusion, see Sections [11-802\(c\)\(6\)](#) & [11-802\(e\)](#), *Institutional Rules on Student Services and Activities*.

Some students mistakenly assume that they can work together on an assignment as long as the instructor has not expressly prohibited collaborative efforts.

- Actually, students are expected to complete assignments independently unless the course instructor indicates otherwise. So working together on assignments is *not* permitted unless the instructor specifically approves of any such collaboration.

Unfortunately, students who engage in unauthorized collaboration tend to justify doing so through various rationalizations. For example, some argue that they contributed to the work, and others maintain that working together on an assignment "helped them learn better."

- The instructor—not the student—determines the purpose of a particular assignment *and* the acceptable method for completing it. Unless working together on an assignment has been specifically authorized, always assume it is not allowed.
- Many educators do value group assignments and other collaborative efforts, recognizing their potential for developing and enhancing specific learning skills. And course requirements in some classes do consist primarily of group assignments. But the expectation of individual work is the prevailing norm in many classes, consistent with the presumption of original work that remains a fundamental tenet of scholarship in the American educational system.

Some students incorrectly assume that the degree of any permissible collaboration is basically the same for all classes.

- The extent of any permissible collaboration can vary widely from one class to the next, even from one project to the next within the same class.
- Be sure to distinguish between collaboration that is authorized for a particular assignment *and* unauthorized collaboration that is undertaken for the sake of expedience or convenience to benefit you and/or another student. By failing to make this key distinction, you are much more likely to engage in unauthorized collaboration. To avoid any such outcome, always seek clarification from the instructor.

Unauthorized collaboration can also occur in conjunction with group projects.

- How so? If the degree or type of collaboration exceeds the parameters expressly approved by the instructor. An instructor may allow (or even expect) students to work together on one stage of a group project but require independent work on other phases. Any such distinctions should be strictly observed.

Providing another student unauthorized assistance on an assignment is also a violation, even without the prospect of benefiting yourself.

- If an instructor did not authorize students to work together on a particular assignment *and* you help a student complete that assignment, you are providing unauthorized assistance and, in effect, facilitating an act of academic dishonesty. Equally important, you can be held accountable for doing so.
- For similar reasons, you should not allow another student access to your drafted or completed assignments unless the instructor has permitted those materials to be shared in that manner.

Plagiarism

Plagiarism is another serious violation of academic integrity. In simplest terms, this occurs if you represent as your own work any material that was obtained from another source, regardless how or where you acquired it.

- Plagiarism can occur with *all* types of media—scholarly or non-academic, published or unpublished—written publications, Internet sources, oral presentations, illustrations, computer code, scientific data or analyses, music, art, and other forms of expression. (See [Section 11-802\(d\)](#) of the *Institutional Rules on Student Services and Activities* for the University's official definition of plagiarism.)
- Borrowed material from written works can include entire papers, one or more paragraphs, single phrases, or any other excerpts from a variety of sources such as books, journal articles, magazines, downloaded Internet documents, purchased papers from commercial writing services, papers obtained from other students (including homework assignments), etc.
- As a general rule, the use of any borrowed material results in plagiarism if the original source is not properly acknowledged. So you can be held accountable for plagiarizing material in either a final submission of an assignment *or* a draft that is being submitted to an instructor for review, comments, and/or approval.

Using *verbatim* material (e.g., exact words) without proper attribution (or credit) constitutes the most blatant form of plagiarism. However, other types of material can be plagiarized as well, such as *ideas* drawn from an original source or even its *structure* (e.g., sentence construction or line of argument).

- Improper or insufficient paraphrasing often accounts for this type of plagiarism. (See additional information on [paraphrasing](#).)

Plagiarism can be committed intentionally or unintentionally.

- Strictly speaking, any use of material from another source without proper attribution constitutes plagiarism, regardless why that occurred, and any such conduct violates accepted standards of academic integrity.
- Some students deliberately plagiarize, often rationalizing this misconduct with a variety of excuses: falling behind and succumbing to the pressures of meeting deadlines; feeling overworked and wishing to reduce their workloads; compensating for actual (or perceived) academic or language deficiencies; and/or justifying plagiarism on other grounds.
- But some students commit plagiarism without intending to do so, often stumbling into negligent plagiarism as a result of sloppy notetaking, insufficient paraphrasing, and/or ineffective proofreading. Those problems, however, neither justify nor excuse this breach of academic standards. By misunderstanding the meaning of plagiarism and/or failing to cite sources accurately, you are much more likely to commit this violation. Avoiding that outcome requires, at a minimum, a clear understanding of plagiarism *and* the appropriate techniques for scholarly attribution. (See related information on [paraphrasing](#); [notetaking and proofreading](#); and [acknowledging and citing sources](#).)

By merely changing a few words or rearranging several words or sentences, you are *not* paraphrasing. Making minor revisions to borrowed text amounts to plagiarism.

- Even if properly cited, a "paraphrase" that is too similar to the original source's wording and/or structure is, in fact, plagiarized. (See additional information on [paraphrasing](#).)

Remember, your instructors should be able to clearly identify which materials (e.g., words and ideas) are your own *and* which originated with other sources.

- That cannot be accomplished without proper attribution. You must give credit where it is due, acknowledging the sources of any borrowed passages, ideas, or other types of materials, and enclosing any verbatim excerpts with quotation marks (using block indentation for longer passages).

Plagiarism & Unauthorized Collaboration

[Plagiarism](#) and [unauthorized collaboration](#) are often committed jointly.

By submitting *as your own work* any unattributed material that you obtained from other sources (including the contributions of another student who assisted you in preparing a homework assignment), you have committed plagiarism. And if the instructor did not authorize students to work together on the assignment, you have also engaged in unauthorized collaboration. Both violations contribute to the same fundamental deception—representing material obtained from another source as your own work.

Group efforts that extend beyond the limits approved by an instructor frequently involve plagiarism in addition to unauthorized collaboration. For example, an instructor may allow students to work together while researching a subject, but require each student to write a separate report. If the students collaborate while writing their reports *and* then submit the products of those joint efforts as individual works, they are guilty of unauthorized collaboration as well as plagiarism. In other words, the students collaborated on the written assignment without authorization to do so, and also failed to acknowledge the other students' contributions to their own individual reports.

Multiple Submissions

Submitting the same paper (or other type of assignment) for two courses *without prior approval* represents another form of academic dishonesty.

You may not submit a substantially similar paper or project for credit in two (or more) courses unless expressly authorized to do so by your instructor(s). (See [Section 11-802\(b\)](#) of the *Institutional Rules on Student Services and Activities* for the University's official definition of scholastic dishonesty.)

You may, however, re-work or supplement previous work on a topic with the instructor's approval.

Some students mistakenly assume that they are entitled to submit the same paper (or other assignment) for two (or more) classes simply because they authored the original work.

Unfortunately, students with this viewpoint tend to overlook the relevant ethical and academic issues, focusing instead on their own "authorship" of the original material and personal interest in receiving essentially double credit for a single effort.

Unauthorized multiple submissions are inherently deceptive. After all, an instructor reasonably assumes that any completed assignments being submitted for credit were actually prepared for that course. Mindful of that assumption, students who "recycle" their own papers from one course to another make an effort to convey that impression. For instance, a student may revise the original title page or imply through some other means that he or she wrote the paper for that particular course, sometimes to the extent of discussing a "proposed" paper topic with the instructor or presenting a "draft" of the paper before submitting the "recycled" work for credit.

The issue of plagiarism is also relevant. If, for example, you previously prepared a paper for one course and then submit it for credit in another course without citing the initial work, you are committing plagiarism—essentially "self-plagiarism"—the term used by some institutions. Recall the broad scope of [plagiarism](#): all types of materials can be plagiarized, including unpublished works, even papers you previously wrote.

Another problem concerns the resulting "unfair academic advantage" that is specifically referenced in the University's definition of scholastic dishonesty. If you submit a paper for one course that you prepared and submitted for another class, you are simply better situated to devote more time and energy toward fulfilling other requirements for the subsequent course than would be available to classmates who are completing all course requirements during that semester. In effect, you would be gaining an unfair academic advantage, which constitutes academic dishonesty as it is defined on this campus.

Some students, of course, do recognize one or more of these ethical issues, but still refrain from citing their authorship of prior papers to avoid earning reduced (or zero) credit for the same works in other classes. That underlying motivation further illustrates the deceptive nature of unauthorized multiple submissions.

An additional issue concerns the problematic minimal efforts involved in "recycling" papers (or other prepared assignments). Exerting minimal effort basically undercuts the curricular objectives associated with a particular assignment and the course itself. Likewise, the practice of "recycling" papers subverts important learning goals for individual degree programs and higher education in general, such as the mastery of specific skills that students should acquire and develop in preparing written assignments. This demanding but necessary process is somewhat analogous to the required regimen of athletes, like the numerous laps and other repetitive training exercises that runners must successfully complete to prepare adequately for a marathon.

Schedule

The information provided below lists the topics we will cover during the semester. The material is covered, in sequential order, in the folders posted on the course website and I encourage students to go over the material for each class ahead of time. The schedule is tentative and subject to change.

Date	Topic	Reading	Assignment
Correlation and Regression			
1/15	Review of normal distribution, sums of random variables, and sample statistics		
1/17	Correlation and simple line regression	Ch. 10.1-10.4	
1/22	Multiple regression and regression inferences (MOD LAB, CBA 5.304 and CBA 5.325)	Ch. 10.5, 11.3	Prob. 10.45
1/24	Multiple regression with dummy variables	Ch. 10.6.1	Prob. 10.23
1/29	Multiple regression with interactions, nonlinear relationships and transformations (MOD LAB)	Ch. 10.6.2, 10.6.3	Prob. 10.27
1/31	Multiple regression with outliers and multicollinearity	Ch. 11.8, 11.9	Prob. 10.31

2/5	Multiple regression: model selection	Ch. 11.4, 11.5, 11.6	Prob. 11.37 (skip ANOVA question)
Time Series Analysis and Forecasting			
2/7	Introduction to time series forecasting	Ch. 12.1, 12.2, 12.4, 12.6	Prob. 11.25
2/12	Moving average, simple exponential smoothing	Ch. 12.7, 12.8.1	Prob. 12.9
2/14	Regression: trends and seasonality	Ch. 12.9.2, 12.9.3	Prob. 12.36
2/19	Case Study		
2/21	Exam 1		
Monte Carlo Simulation and Risk Analysis			
2/26	Sensitivity Analysis in Excel		
2/28	Introduction to Monte Carlo Simulation	Ch. 15.1-15.3	
3/5	Simulation in a spreadsheet	Ch. 15.5	
3/7	Example: Retirement planning (MOD LAB)	Ch. 15.5, 16.3	Prob. 15.12

3/19	Example: Capacity planning (MOD LAB)	Ch. 16.2	Prob. 15.29, part a only
3/21	Example: Modeling time series (ABM and GBM) (MOD LAB)	Ch. 12.5	Prob. 16.19
3/26	Example: Mean reverting process		Prob. 16.38
3/28	Case study		
4/2	Exam 2		
Decision Analysis			
4/4	Introduction to decision trees	Ch. 6.1, 6.2	
4/9	Decision trees with Precision Tree	Ch. 6.2-6.3	
4/11	Oil case and options (MOD LAB)	Ch. 6.3	Prob. 6.37 part b only
4/16	Value of perfect information	Ch. 6, p. 321	Prob. 6.39 part b only
4/18	Bayes rule (MOD LAB)	Ch. 3.4	Prob. 6.56 part c only

4/23	Value of imperfect information	Ch. 6.5	Prob. 6.47
4/25	Examples (MOD LAB)		Prob. 6.56 part b only
4/30	Case study		
5/2	Review for Exam 3		