ORI 397
DECISION ANALYSIS II

1. Teaching Team
<u>Instructor</u>
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2. Course Description and Objectives
In this class we will develop the framework, tools, and processes needed to make high-quality decisions in personal and professional settings. We will focus upon making decisions in complex and uncertain environments. This complexity could stem from complex technical concerns or organizational complexity with many parties in conflict.

We will learn how to talk and think differently about decision making. We will practice this on weekly problems and a semester long case study.

This course is a complement to Decision Analysis I. Where DA I is focused up on the underlying theory of decision making under uncertainty, this course, is focused upon the practical application of that theory. Throughout the course of the semester, you may question why we do things the way we do.

Prerequisite: None.

3. Text
- *Decision Quality: Value Creation from Better Business Decisions* by Carl Spetzler, Hannah Winter, and Jennifer Meyer. You can find this at Amazon or at the Co-op.
- Instructor notes
- *The 7 Habits of Highly Effective People* by Stephen R. Covey
- Optional Text: *Decision Analysis for the Professional* (4th Edition)
- Optional Text: *Readings on The Principles and Applications of Decision Analysis*

4. Course Calendar
We will conform to the University Academic Calendar.

If a class needs to be canceled for any other reason, you will be notified at least one week in advance—if at all possible.

5. Course Website and Handouts
All course material will be posted on Canvas (http://canvas.utexas.edu/).

6. Coursework

Homework
There will be a weekly homework assignment (approximately 12 in total), which will be distributed on Thursday and will be due at the start of class the following Thursday. If the following Thursday is a University holiday, the assignment will be due the following Tuesday at the start of class. The teaching team will strive to grade your homework and return it during class on Thursday. **Late homework will not be accepted.**

Consideration for University Authorized Absences will be made. Out of respect for your instructor and fellow students, please give advance notice of any absences if possible.

Your homework must be clear and neat. You may work on homework in at most teams of **two to three**. However, any work you submit must be your own (i.e., you must fully understand what you submit).

You must staple your homework and put your name on it. Homework that is not stapled will lose 10 points. Homework without a name will be given a grade of 0.

Homework extra credit!! We will give up to 10 points (out of 100—so 10%) of extra credit on each homework assignment if you provide an example that appeared in a newspaper or magazine that would benefit (or require) the use of the principles we discuss in this class. Note: it could be any of the principles we have discussed—not just what is covered on that assignment. To receive credit you need to provide a copy of the article and a brief write-up (less than 1 page) with what decision analysis concepts/tools you would use for this problem. You don't have to solve the problem (since you may not have enough information), but you need to demonstrate that you understand how what we are learning in class could apply.

Note that this portion of your homework needs to be worked on an individual basis. Please turn your extra credit in separately from your homework and label it Extra Credit. This makes it easy for us to grade it.

Case Studies
You will work in teams of 3 to 4 on single case study that will last the entire semester and, perhaps, a few mini-case studies. These case studies will involve the application of decision analysis to a real-world problem. You must for your own teams. I will ask each of you evaluate yourself and your team members at the conclusion of each case study.

Examinations
There will be a midterm and a final, according to the following schedule:

Midterm during our regularly scheduled class.

Final Exam
According to the University Exam Schedule https://registrar.utexas.edu/schedules/169/finals

If you have another exam that interferes with this time you must let me know within four weeks of the first lecture. No exceptions will be made after this date. **Do not make travel plans that necessitate your leaving campus before the final exam!**

There will be no "pop" quizzes.

Consideration will **only** be made for University Authorized Absences.

Exams will cover material from the course notes, readings, homework, **and** lecture. Exams will be closed notes.

You may use a calculator on the exams. This includes financial calculators. **However, you must clearly show your work**. Your work needs to be such that someone could reproduce your answer without the use of a financial calculator or spreadsheet. No credit will be given for a problem where this is not the case.

7. Attendance
We will not take attendance. This course is about decision-making. As such, you face a decision on whether or not to attend class. You will have to weigh the benefit of attending class (e.g., deeper understanding, great lectures, etc.) against its cost (e.g., the time you will spend, risk of being hit by a bicycle, etc.). We are confident you will find the lectures both helpful and entertaining. Choose wisely. If you choose to attend class, we expect you to participate fully and act professionally.

8. Letter Grades
Your exams and homework will be weighted as follows:

Homework: 15%
Case Studies: 25%
Midterm: 30%
Final Exam: 30%

Your weighted average score for the course will be rounded up to the **nearest integer** using Microsoft Excel's® Roundup function. For example, if your weighted average score for the course was 90.3, it would be rounded to 91. A final score of 89.5 would be rounded to 90. Rounding up will take care of any "close calls" and further adjustments will not be made.

Your scores on individual exams, homework, project and the quizzes not be rounded.

Total points will map to letter grades according to the following schedule:

A = 90% or greater
A- = 85% to < 90%
B+ = 80% to < 85%
B = 75% to < 80%
B- = 70% to < 75%
C = 55% to < 70%
D = 40% to < 55%
F = < 40%

The instructor reserves the right to increase your total score by "curving" or some other method. However, these changes will never lower your grade.

9. A Note to Those Taking this Course for a Letter Grade
You have decided to take this course for a grade. I have agreed to assign you a letter grade. I have done my best to design a grading system that (a) maps your understanding to your letter grade, (b)

provides the incentive to master course material in a timely fashion, (c) emphasize the concepts discussed in the class.

10. Course Topics

Please note: We may not cover all these topics and the order may be slightly different. We will adjust based on class performance and interest.

- What is Decision Analysis?
- Decision Analysis Cycle
- Decision Quality
- Decision Making Processes (DDP)
- Decision making styles
- Decision Framing (decision hierarchy)
- Generating Alternatives (strategy table)
- Clear Values and Tradeoffs (direct vs indirect values)
- Direct vs Indirect values (Direct values are an issue of preference, indirect are an issue of information)
- Discounted cash flow, discount rates and opportunity cost
- Decision Modeling (influence diagrams)
- Spreadsheet Modeling
- Deterministic Analysis (base case, water falls, tornado diagrams)
- Probability Assessment & Measurement
- Fermi questions
- Biases
- Assessment procedure
- Discretization
- Probabilistic Analysis
- Probability
- Trees
- Bayes
- Monte Carlo (theory and useful distributions)
- Distributions
- Value of Information and Control
- Presentations and graphics
- Ethics and decision making

11. Learning Environment

Asking Questions

I want you to do well and am concerned about your performance. This material is important. Really!

It is vital that if, during a discussion, there is something you do not understand or the explanation is poor, PLEASE stop me and ask questions. I would prefer that we have a dialog during class sessions and not simply lectures.

Treating Each other with Respect

In order to develop a safe learning environment, I expect everyone to be treated with respect and dignity. Failure to do so will negate your ability to attend lecture.

12. Honor Code

After you graduate and enter the workforce your boss will expect that you have been educated. In the "real world" there are no make-up exams or partial credit. Therefore, cheating will hurt you in the long run. I expect everyone to follow the UT Honor Code, which states:

"The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community."

All suspected violations of the Honor Code will be referred to the Administration for adjudication.

13. University Electronic Mail Notification Policy
(Use of E-mail for Official Correspondence to Students)

All students should become familiar with the University's official e-mail student notification policy. It is the student's responsibility to keep the University informed as to changes in his or her e-mail address. Students are expected to check e-mail on a frequent and regular basis in order to stay current with University-related communications, recognizing that certain communications may be time-critical. It is recommended that e-mail be checked daily, but at a minimum, twice per week. The complete text of this policy and instructions for updating your e-mail address are available at http://www.utexas.edu/its/policies/emailnotify.html.

In this course e-mail will be used as a means of communication with students. You will be responsible for checking your e-mail regularly for class work and announcements. Note: if you are an employee of the University, your e-mail address in Canvas is your employee address.

14. Disability Statement

Students with disabilities who require special accommodations need to get a letter that documents the disability from the Services for Students with Disabilities area of the Office of the Dean of Students (471-6259 voice or 471-4641 TTY for users who are deaf or hard of hearing). This letter should be presented to the instructor in each course at the beginning of the semester and accommodations needed should be discussed at that time. Five business days before an exam the student should remind the instructor of any testing accommodations that will be needed.

See website below for more information:
http://deanofstudents.utexas.edu/ssd/providing.php

15. Canvas Use

This course uses Canvas, a Web-based course management system in which a password-protected site is created for each course. (Student enrollments in each course are updated each evening.) Canvas can be used to distribute course materials, to communicate and collaborate online, to post grades, to submit assignments, and to take online quizzes and surveys.

You will be responsible for checking the Canvas course site regularly for class work and announcements. As with all computer systems, there are occasional scheduled downtimes as well as unanticipated disruptions. Notification of these disruptions will be posted on the Canvas login page. Scheduled downtimes are not an excuse for late work. However, if there is an unscheduled downtime for a significant period of time, I will make an adjustment if it occurs close to the due date.

Canvas is available at http://courses.utexas.edu. Support is provided by the ITS Help Desk at 475-9400 Monday through Friday 8 am to 6 pm, so plan accordingly.

16. Course Feedback

Feedback is an important part of any kind of learning. Without feedback on how well you understand the material, it is more difficult for you to make significant progress. During this course you will give me feedback on your learning in informal and formal ways, such as assignments or exams. I want you to let me know when something we discuss is not clear. This kind of communication will enable me to provide additional information when needed or to explain a concept in different terms.

In addition to feedback on your learning, I will ask for feedback from you about how my teaching strategies are helping or hindering your learning. This kind of feedback is very important to me as I continually strive to be the best teacher I can be. Some of this feedback will be gathered from online anonymous surveys. I encourage you to respond to these surveys so that together we can create an effective teaching and learning environment.

17. About Your Instructor

I went to graduate school at Stanford University and hold an MS and PhD. in of Engineering-Economic Systems (1999). The Department of Engineering-Economic Systems merged with Industrial Engineering and Operations Research to form the department of Management Science & Engineering. My advisor was Professor Ronald Howard, who coined the term "decision analysis" in 1964. I am President of the INFORMS Decision Analysis Society.

I am a Director at Strategic Decisions Group (www.sdg.com). SDG, founded in 1981 by Professor Howard, is the premier decision analysis consulting firm. I joined SDG in 1995, where I apply decision analysis techniques to the most important decisions facing some of the world's largest corporations. I have worked in North America, South America, Europe and Asia. Industries included metals, building services, biotech, commodity and specialty chemicals, energy trading and marketing, insurance, oil & gas, power generation and transmission, printing and publishing, and packaging. In most cases, I work directly with the CEO/CFO/COO, executive vice president, vice president, or business unit head to address major strategic choices.