Fall 2016   GE 530

Decision Making with Multiattribute Utility Analysis

Professor: Professor Deborah L. Thurston
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Office Hours: To be determined

Credit: 1 unit
Time: Mondays and Wednesdays, 9:00 -10:50
Class Location: 203 Transportation Building

COURSE DESCRIPTION - Engineering decisions must often be made in the face of uncertainty. Tradeoffs must be weighed according to each decision maker's own subjective judgment and attitude towards risk. This course provides the student with background and practice in applying tools for subjective tradeoff decision making when present or future states of nature are uncertain. We will consider both descriptive (how *do* people currently make decisions) and normative (how *should* people make decisions) models.

COURSE OBJECTIVES - To study the meaning and application of normative analytic decision making techniques for   technical decision making under uncertainty. To learn a specific set of analytic tools.

These tools are applicable to technical decisions which must be made when present or future states of nature are uncertain, and multiple attributes are considered. They take into account the decision maker's assessment of risk and uncertainty, and his or her attitude towards risk, and include decision tree methodology and multiattribute utility analysis.

REQUIRED TEXTS – The required text is *Making Hard Decisions with DecisionTools®* by Robert T. Clemen and Terence Reilly. The DecisionTools® software CD that comes with the text may be used to complete the homework assignments. If you purchase a used text containing previously registered software, the publisher requires that you purchase a new code to access the software. However, many students in the past have not needed this software and instead create their own spreadsheets to do the analysis, or use other commercially available software.

A variety of other readings will also be assigned, including journal articles from the technical literature.

HOMEWORK and CLASS EXERCISES- Homework exercises will be assigned, but not handed in or graded. Instead, in-class exercises will cover the homework as well as other concepts.

EXAMS - There will be two in-class exams and a cumulative final. You may bring 1 page of notes with you to each exam.

GRADING

15%   Class Exercises
20%   Exam #1
20%   Exam #2
25%   Final Exam (Cumulative)
20%   Project

Expectations and Outcomes (aka Here's The Deal)

Professor Thurston Agrees to:
Arrive to class on time
Be prepared for class
Put effort into assigning homework and readings that effectively use students' time
Grade fairly and consistently
Treat each student comment or question with respect
Turn off her cell phone during class

Each Student Agrees to:
Arrive to class on time
Be prepared for class
Stay for the duration of the class
Put your own effort into working through the problems before asking for help
Discuss class material with classmates, but no copying, cheating, plagiarizing
Share your decision mistakes and questions without fear of ridicule
Turn off cell phone and laptop during class

Learning Outcomes
After successful completion of this course, students will be able to:
Recognize a decision problem when they see it.
Understand how to use analytic tools for making decisions.
Be able to compare and contrast alternative tools for making decisions.
Formulate an abstract model of the decision problem using decision trees and utility functions.
Assess a decision maker's attitude towards risk using lottery assessment questions.
Assess a decision maker's willingness to make tradeoffs.
Understand why smart people sometimes make irrational decisions.
Help people, including yourself, make better decisions.