Course Description
Normative Decision-Making Models begins with a review of optimal decision-making models under constrained resources (linear programming) and uncertainty (classic decision analysis). The course explores the relationships between these prescriptive models and more descriptive approaches to decision modeling and system dynamics simulation normally taught in the Decision and Policy Sciences (DAPS) concentrations. The course is being offered this semester as a PhD pro seminar, hence students will typically have completed a significant portion of advanced DAPS-related coursework. The course will meet from 1:30 to 3:30 every Thursday immediately after the DAPS brown bag seminar.

Course Overview
The course reviews normative models used to support decision making across a broad spectrum of the policy and management sciences. The course explores the many linkages between these normative models and the more descriptive approaches to policy and management science modeling featured in most of the DAPS course work here at Albany. In this sense, the seminar will cover material that knits together and provides a framework for relating the diverse modeling approaches within DAPS. The course begins with a fast review of normative modeling approaches. It ends with a series of talks on special topics that will expose students to the faculty in the DAPS concentration. The overall tone and pace of the course is that of a pro seminar for Ph.D. students.

Topics

Part 1: Basic Concepts and Techniques of Normative Models
I-A. A Framework for Normative Models
   • A fast review of normative models from RPAD 504
   • Descriptive, normative, and optimal approaches to decision modeling
   • Meta assumptions in various modeling approaches
   • Value models, environmental models, and models of uncertainty
I-B Optimal Decisions Under Constrained Resources (basic Linear Programming Model)

- The Basic LP Set up
- Graphical and numeric solutions
- Slack and surplus variables
- Duality and Post optimality analysis
- Extensions to non-linear, dynamic, goal programming and integer programming
- Computational approaches

I-C Optimal Decisions Under Uncertainty

- Decision trees
- Influence diagrams
- Expected value and other decision criteria
- Expected value of perfect information
- Bayes Theorem and expected value of sample information
- Introduction to utility theory
- Computational issues

Part II: Normative Models in the DAPS Curriculum
The second set of topics will be faculty members of the DAPS group presenting special topics that reflect their own work and its relationships to normative modeling of decision processes. Topics have not yet been selected, but possible topics might include

II-A Normative Models and System Dynamics Simulation

- Feedback thinking as a normative decision making framework
- Comparing linear dynamic systems to the basic static linear programming problem
- Objective functions that vary over time
- Tools in Vensim for dynamic optimization
- Dynamic decision-making

II-B Normative Models and Decision Modeling

- Normative vs. Descriptive approaches to studying decision modeling
- The Threshold Model of decision making
- Taylor-Russell Framework and judgmental accuracy
- Von Neumann-Morgenstern axioms for normative decision making
- Dynamic decision-making

II-C Evaluation of Normative Models

- Critiques of implementation/utility of normative models
- Experimental approaches to testing normative models
- Experimental programs of research for decision making in dynamic environments

II-D Other Topics

- Small Group Decision Making and normative approaches
• Impact of social and electronic networks on decision-making
• Signal Detection Theory
• Medical Decision making
• The Mumpower-Stewart threshold model for decision making
• Use of optimization tools to calibrate dynamic models
• Evaluation of Means vs. Ends models in public policy decisions.

Part III: Individual Project Related to Normative Decision Models
As the last segment of this course, students will present and work on a project related to their own prior DAPS coursework. This project will use the frame of normative analysis and modeling to view this topic. Students will present a project proposal and a final paper as a major component of the course.

Nuts and Bolts of How This Seminar Will Work
Students should expect several quite different threads of teaching and learning activities, appropriate to the various types of material being covering in the course.

Part I: Basic Concepts and Techniques of Normative Models. For the first portion of the class, we will meet informally and work through the topics associated with Part I by reading and doing selected problems from Anderson, Sweeney and Williams.

Part II: Normative Models in the DAPS Curriculum. For the second part of the class, we will invite in faculty from the DAPS presentation to make basic presentations on normative modeling from the point of view of their specialization in the DAPS concentration.

Part III: Special Topics in Normative Decision Models. The third part of the class will involve an individual project proposed by each student.

Grading
Part I Assignments 15%
Part II Readings, Assignments and Follow Up Work 10%
Part III Proposal Paper 10%
Part III Final Paper 40%
Class Participation 25%

Text, Reading, and Software
• Course Readings: To Be Distributed in class and over the Web via E-Res.² The password for the E-Res system is “pad620and”.

¹ This is quite an expensive text (Amazon.com charged me more than $100 for my copy). You should have a text such as this one on your shelf if you are serious about Decision and Policy Sciences topics. The good news is that an earlier edition of the book may work for you and there is a market for these books used.
• Basic Software support will rely on Micro-Soft EXCEL and its plug-ins.
• Various advanced assignments may require use of additional software packages, especially technical papers focusing on software applications. Exact software packages will vary from case to case.

Policy on Incompletes and late Work
I will not assign incompletes for this course except in the case of a medical emergency certified by a physician. In the case of a medical emergency, I will require a written proposal for completing all unfinished work (normally one or two weeks after the close of classes). Material turned in late will be marked down or will be given no credit.

Time Commitment for this course
This is a four-credit graduate course. Hence you should plan on spending four hours per week in class and in the lab plus approximately eight hours per week doing the reading and preparing problem sets, worksheets, and cases. Students with strong prior background or experience in modeling may spend less time than this. Students with little prior background may have to spend more time than this, especially in the first several weeks. If you discover that you are spending more time than this on the course, please let me know so that we can discuss it.

Plagiarism and Cheating
Due to the intensive nature of this course, students are encouraged to form study groups and to work together on assignments. Learn by interacting with one another—support and help one another. However, some work such as in-class or take-home exam assignments will be clearly expected to reflect individual effort. For these assignments you are expected to neither give nor receive assistance from anyone. As a policy for this course, plagiarism or cheating will result in a failing grade for the whole course. In addition, as instructor, I will pursue further disciplinary action at the University course level. For the purposes of this course, the following are taken as evidence of plagiarism or cheating:

• Material reproduced from another source without any or adequate citation.
• Identical answers being turned in by two or more students.
• A pattern of unusually similar answers being turned in by two or more students.
• Written answers or solutions that a student can not logically explain verbally.
• Other evidence of collaboration between students on an in-class or take-home assignment that was intended to reflect individual effort.

Since this is such an important matter, if you have any questions about this course policy, you should ask the module instructor and the instructor of record for any clarification that you may need.

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2 Most of the topics in the later part of the course will be guest lectures. Each guest lecturer will suggest a packet of readings. I will do my best to get these readings to you in advance of the guest lectures.
RPAD 620 Normative Decision-Making
Meeting Dates and Major Topics, Spring 2012

Jan 19     Introduction and Course Overview
Jan 26     The Basic LP Model
Feb 2      Post Optimality Analysis/ Decision Analysis Part I
Feb 9      Expected Value of Sample and Perfect Information
Feb 16     First Presentation of Class Projects
Feb 23     Visiting Faculty Presentation³ Stephen Weinerg
March 1     Visiting Faculty Presentation
March 8     Visiting Faculty Presentation
March 15    SPRING BREAK
March 22    Andersen at I-Choose Research Seminar
March 29    Visiting Faculty Presentation
April 5     Presentation and Discussion of Part III Projects
April 12    Presentation and Discussion of Part III Projects
April 19    Presentation and Discussion of Part III Projects
April 26    Presentation and Discussion of Part III Projects
May 3      LAST CLASS—Final Project Discussions
May 10     All Material for Class Due (no class meeting)

³ Faculty presentations drawn from the DAPS faculty. Details to be arranged.