CRP 3210

Introduction to Quantitative Methods for the Analysis of Public Policy

This course introduces students to the principles of quantitative policy analysis. We consider core modeling tools used by planners and policy analysts to identify optimal choices in the face of interdependent alternatives, limited resources, and uncertainties. The models to be discussed are of the analytical, quantitative category, including decision trees, difference equations, linear programming, and benefit-cost analysis. Effectiveness in structuring complex problems and in reducing the complexity of a problem is the unifying theme in this wide array of tools. The course emphasizes the applications to planning and public policy decision making. To that end, the lectures balance theoretical concepts, real-world applications, and computer simulations.

LEARNING OBJECTIVES

Upon completion of this course, students will:

- Develop the abilities to structure complex planning problems;
- Obtain working knowledge of the tools discussed, and be critically aware of the tools’ strengths as well as limitations;
- Understand the basic mechanics of the models discussed and be able to identify the planning problems for which the models would be appropriate;
- Gain the skills in spreadsheet modeling to perform model-driven calculations, solve equations, and run what-if scenarios.

PREREQUISITES

- General interests in policy issues, and positive attitude towards approaching them analytically;
- The course is designed to be a “second course” in quantitative reasoning, which means students are expected to have a good command of high-school algebra, and have completed courses in introductory statistics and principles of economic analysis.

READING MATERIALS

Primarily drawn from the followings:


Hopkins is available through Campus Store. Copies of all three texts are on reserve in the Fine Arts Library.
**Grade Evaluation**

Final grade will be determined according to the following scheme:

- 10 percent – class attendance and participation
- 40 percent – problem sets
- 50 percent – mid-term exam and final exam (2 x 25 percent).

- **Attendance**
  This class is like a job. You can miss a day’s work here and there with no problem; however, more than that has consequences. More than four absences will result in a grade of zero for the class participation portion of the grade.

- **Participation**
  Come to class prepared to share your insights and questions, and learn from the considered views of others.

- **Homework assignments**
  Homework is assigned roughly every other week. I expect to assign 5-6 problem sets during the semester. Although responses should be submitted individually, I encourage you to work in study groups. You will have at least 1 week to complete an assignment.

- **Optional policy paper**
  You may choose to submit a short policy paper (of max. 10 pages) just before the study break in December. The assignment provides you an opportunity to apply one of the quantitative methods discussed in class. The instructor will provide methodological advice, but students will be responsible for identifying the topic. The policy paper is a strictly individual assignment.

  You may identify a potential interviewee (planners, community leaders, public managers, etc.) who has worked on your topic of interest. Then explore—in a confidential interview—how your interviewee has dealt with a complex planning problem in practice. We need to critically reflect about how the tools we learn in class could help structure the problem, their limitations, and whether additional tools are needed.

- **Exams**
  The final exam is not cumulative. The exams are open book.

  **Regrades:** All regrade requests must be done *in writing*. Please attach to your work a note explaining why you think the grade you have received is not appropriate. Note that a request to check for arithmetic error in adding up points will be granted right away and does not constitute a regrade request.

- **Labs**
  The Teaching Assistant will lead the lab sessions on Wednesday evenings (starting at 7:30 pm) of most weeks, including in the week where a problem set is due or an exam is scheduled. All labs are in the West Sibley 3rd floor Jones Lab (Room SBL 305).
**Blackboard**
I will post most of the course materials, including announcements, homework assignments, homework solutions, reading materials, and other handouts in the course website on the Blackboard.

**Policy on laptops & cell phones**
Laptops may be used for note-taking and participating in exercises during class. They should not be used for reading or sending e-mail or engaging in other diversions. Cell phones should be turned off at all times during class. No texting during class is permitted.

**Code of academic integrity**
All academic work must meet the standards contained in the “Cornell University Code of Academic Integrity” ([http://cuinfo.cornell.edu/Academic/AIC.html](http://cuinfo.cornell.edu/Academic/AIC.html)). Students are responsible for informing themselves about those standards before completing any academic work. The individual assignments and term paper, in particular, are your own work and responsibility.

**Accommodations for students with disabilities**
In compliance with the Cornell University policy and equal access laws, I am available to discuss appropriate academic accommodations that may be required for student with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances, so arrangements can be made. Students are encouraged to register with Student Disability Services to verify their eligibility for appropriate accommodations.

**IMPORTANT DATES**
- **Fall Break 10/10 – 10/13** (No class Tuesday Oct. 13th)
- **Tuesday, 10/20**
  Mid-term exam (time and location TBA)
- **Thursday, 10/22**
  Tentative no class (annual meetings of the Association of Collegiate Schools of Planning)
  And/or
- **Thursday, 11/12**
  Tentative no class (annual meetings of the Regional Science Association)
- **Thanksgiving Recess 11/25 – 11/29** (No class Thursday Nov. 26th)
- **Friday, 12/04**
  Optional paper due (max. 10 pages, double spaced)

**Final Exam**
Location, Date and Time: TBA. Final exam DATES will be published Friday, September 18th.

The following due dates for homework assignments are subject to change.

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<thead>
<tr>
<th>Assignment</th>
<th>Tentative due date</th>
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<tbody>
<tr>
<td>Homework 1</td>
<td>Fri 09/04</td>
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<tr>
<td>Homework 2</td>
<td>Fri 09/18</td>
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<tr>
<td>Homework 3</td>
<td>Fri 10/02</td>
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Tentative Outline of Topics (May change to accommodate student needs)
The following outline is intended to provide a general (and rough) guidance. I may add/drop topics or change the order of the presentation as the course progresses.

Planning Analysis & the Logic of Plans
Readings:

Decision Analysis
Reading:
- Stokey and Zeckhauser, Chapter 12.

Difference Equation
Reading:
- Stokey and Zeckhauser, Chapter 4.

Demographic Forecasting
Readings:

Queues
Readings:
- Stokey and Zeckhauser, Chapters 5 & 6.

Project Evaluation
Topic: benefit-cost analysis.
Readings:
- Stokey and Zeckhauser, Chapter 9.
A General Framework for Policy Analysis
Readings:

Equity Planning
Reading:

Linear Programming
Readings:
• Stokey and Zeckhauser, Chapter 11.
• Ragsdale, Chapters 2–4.