IEMS 490 Health Policy Modeling

Fall 2009   Professor Benjamin Armbruster

Description   Phd level course on the application of mathematical, statistical, economic, and systems models to problems in health policy. Areas covered include disease screening, diagnosis, treatment; assessment of medical technologies; organ allocation policies; and capacity planning. The policy issues studied will encompass a variety of diseases and health conditions including HIV/AIDS, coronary artery disease, asthma, hepatitis C, liver transplants, and pandemic influenza. The analyses will encompass a variety of modeling techniques including simple cost analysis; cost-effectiveness analysis; statistical and probabilistic analysis; decision analysis; risk analysis; simulation; Markov models; linear programming; Markov decision processes, and simulation and control of dynamical systems.

Class website   http://users.iems.northwestern.edu/~armbruster/2009iems490/

Prerequisites   Bachelor's level understanding of basic concepts in probability, statistics, differential equations, and optimization.

Class Times   Tuesday, Thursday 9:00am - 10:50am, Tech M228

Instructor   Professor Benjamin Armbruster, Tech M237
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Office Hours   After class, and by appointment

Textbook   none

Readings   All readings will be posted online and should be read in advance of the session in which they are discussed.

Assignments   For each session (starting with lecture 2), each student should prepare a 1-2 page write-up on the readings that addresses the following questions, as appropriate: What policy question(s) are addressed in the paper(s)? How important are these questions? What are the most important assumptions of the analysis? Are any of these assumptions questionable? What non-quantifiable factors are relevant to the policy question(s)? Are the authors' conclusions justified? Is the analysis useful for the policy question?

In addition, each student must write a term paper going into more depth on one subject. The paper could be a critique of an existing study and extend the analysis; a critique of several studies addressing the same policy question; or a new policy study.