UNIVERSITY OF MINNESOTA
School of Public Health

PubH 6561
Quantitative Methods Applied to Problems in Healthcare
Course Syllabus

Spring 2012

Credits: 2

Meeting Day, Time, Place: Tuesday 1:25 – 3:20pm, Mayo D325

Instructor: François Sainfort

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Office Hours: Tuesday 12 to 1:00pm or by appointment

Teaching Assistant:

E-mail:

Office Address:

Office Hours:

Course Description

In this course you will study the concepts of how to formulate, structure, analyze, and solve complex decision problems in health care. Specific concepts to be reviewed include: decision trees for modeling decision problems, Bayesian analysis as applied to decision analysis, the concept and use of subjective probability, the value of information, the use of probability models for solving decision problems, basic simulation techniques, and risk attitudes and risk analysis. The course relies heavily on student hands-on use of computer-based modeling tools, including spreadsheets and spreadsheet add-ins, provided with the textbook. Emphasis will be placed on formulating, designing, and constructing models, drawing conclusions from model results, and translating results into written end-user reports to support decision making.

Course Prerequisites

- PubH 6560 – Operations Research and Quality in Health Care (or equivalent)
- PubH 6541 – Statistics for Health Management Decision Making (or equivalent).

Course Goals and Objectives

Upon completion of this course, you should be able to:

1. Break down complex decision problems into sub-problems to analyze them and make recommendations.
2. Apply a variety of decision analysis, sensitivity analysis, risk analysis and simulation modeling techniques in an Excel environment.
3. Develop models to understand and improve health care operations, using all steps of the decision analysis process – decision modeling, uncertainty modeling and preference modeling.

4. Use computer software to analyze data and model health care problems.
5. Interpret model output to recommend optimal decisions with respect to well-defined objectives.
6. Present and communicate findings and recommendations to end-users in a professional, concise written format.

Methods of Instruction and Work Expectations

Class will be a combination of lecture and hands-on problems.

1. Attend and actively participate in class, including being prepared and displaying proper classroom etiquette
2. Read assigned materials and complete assigned exercises before class.
3. Submit all assignments.
4. Take and pass all tests.
5. Complete and submit a course evaluation.
6. Follow scholastic conduct policy.

Course Text and Readings

1. Albright, Winston and Zappe, Data Analysis and Decision Making – Fourth Edition, South-western Cengage Learning, 2011
2. Selected readings available via the course website.

Statistical Software

Excel 2007/2010 will be used. This course also uses the student version of the DecisionTools® Suite that comes with the textbook. Three of the tools within the suite will be primarily used: Precision Tree, BestFit, and @Risk. Please note that the add-ins do not work in the MacIntosh version of Excel. If you are a Mac user, you will need to install Windows 7 on your Mac (using Parallel Desktop). Instructions for using Excel and the other software applications will be integrated into modules throughout the semester.

Evaluation and Grading

Four assignments (25% each)

Assignments will be posted on the website and should be submitted electronically to the course's moodle site, NOT emailed to the professor's email. Any Excel directions provided in the homeworks or exams will be based on Microsoft Excel 2007/2010.

Course Evaluation
The SPH collects student course evaluations electronically using a software system called CoursEval. The system will send email notifications to students when they can access and complete their course evaluations. Students who complete their course evaluations promptly will be able to access their final grades just as soon as the faculty member renders the grade. All students will have access to their final grades two weeks after the last day of the semester regardless of whether they completed their course evaluation or not. Student feedback on course content and faculty teaching skills are important means for improving our work. Please take the time to complete a course evaluation for each of the courses for which you are registered.

Incomplete Contracts
A grade of incomplete "I" shall be assigned at the discretion of the instructor when, due to extraordinary circumstances (e.g., documented illness or hospitalization, death in family, etc.), the student was prevented from completing the work of the course on time. The assignment of an "I" requires that a contract be initiated and completed by the student before the last day of class, and signed by both the student and instructor. If an incomplete is deemed appropriate by the instructor, the student in consultation with the instructor, will specify the time and manner in which the student will complete course requirements. Extension for completion of the work will not exceed one year (or earlier if designated by the student's college). For more information and to initiate an incomplete contract, students should go to: www.sph.umn.edu/grades.

University of Minnesota Uniform Grading and Transcript Policy
A link to the policy can be found at onestop.umn.edu.

Course Outline

The planned schedule is as follows and may be adjusted as needed.

Jan 17	**Introduction and Overview** ✓ Chapter 1 ✓ Bernoulli article
Jan 24-31	**Probability Basics and Introduction to Simulation** ✓ Chapter 4 ✓ @RISK tutorial
Feb 7-14	**Probability Distributions and Applications** ✓ Chapter 5
Feb 21-28	**Decision Making under Uncertainty** ✓ Chapter 6 ✓ PrecisionTree tutorial
Mar 6	**Sensitivity Analysis and Value of Information** ✓ Handouts
Mar 13	**Spring Break – No Class**
Mar 20	✓ **Applications**
Mar 27-Apr 3	**Introduction to Optimization** ✓ Chapter 13
Apr 10-17	**Simulation Modeling** ✓ Chapter 15
Apr 24-May 1	**Applications** ✓ Chapter 16

Other Course Information and Policies

Grade Option Change

For full-semester courses, students may change their grade option, if applicable, through the second week of the semester. Grade option change deadlines for other terms (i.e. summer and half-semester) can be found at onestop.umn.edu.

Course Withdrawal

Students should refer to the Refund and Drop/Add Deadlines for the particular term at onestop.umn.edu for information and deadlines for withdrawing from a course. As a courtesy, students should notify their instructor and, if applicable, advisor of their intent to withdraw.

Students wishing to withdraw from a course after the noted final deadline for a particular term must contact the School of Public Health Student Services Center at sph-ssc@umn.edu for further information

Student Conduct, Scholastic Dishonesty and Sexual Harassment Policies

Students are responsible for knowing the University of Minnesota, Board of Regents' policy on Student Conduct and Sexual Harassment found at www.umn.edu/regents/polindex.html.

Students are responsible for maintaining scholastic honesty in their work at all times. Students engaged in scholastic dishonesty will be penalized, and offenses will be reported to the Office of Student Academic Integrity (OSAI, www.osai.umn.edu).

The University's Student Conduct Code defines scholastic dishonesty as "plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; or altering, forging, or misusing a University academic record; or fabricating or falsifying of data, research procedures, or data analysis."

Plagiarism is an important element of this policy. It is defined as the presentation of another's writing or ideas as your own. Serious, intentional plagiarism will result in a grade of "F" or "N" for the entire course. For more information on this policy and for a helpful discussion of preventing plagiarism, please consult University policies and procedures regarding academic integrity: http://writing.umn.edu/tww/plagiarism/.

Students are urged to be careful that they properly attribute and cite others' work in their own writing. For guidelines for correctly citing sources, go to http://tutorial.lib.umn.edu/ and click on “Citing Sources”.

In addition, original work is expected in this course. It is unacceptable to hand in assignments for this course for which you receive credit in another course unless by prior agreement with the instructor. Building on a line of work begun in another course or leading to a thesis, dissertation, or final project is acceptable.

If you have any questions, consult the instructor.

Disability Statement

It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have a documented disability (e.g., physical, learning, psychiatric, vision, hearing, or systemic) that may affect their ability to participate in course activities or to meet course requirements. Students with disabilities are encouraged to contact Disability Services to have a confidential discussion of their individual needs for accommodations. Disability Services is located in Suite180 McNamara Alumni Center, 200 Oak Street. Staff can be reached by calling 612/626-1333 (voice or TTY).