Course Objectives:

This course provides hands-on training in decision and cost-effectiveness analysis using TreeAge software. It is intended for those students who are interested in doing their own modeling, as it is a time-intensive lab and project course. Topics to be covered include:

- How to use TreeAge.
- How to program Markov Models in TreeAge.
- How to do one-way sensitivity analyses and graph tornado diagrams using Microsoft Excel.
- How to do Monte Carlo probabilistic sensitivity analyses in TreeAge.
- Pitfalls and controversies in cost-effectiveness modeling.

Course Requirements:

Each student will complete a three-part tutorial using TreeAge. Thereafter, students will complete an identical cost-effectiveness model using the same model inputs and suggestions. Hence, there will be a correct answer. Most of your work on the decision model will be completed outside of class, and homework assignments will lead to progressive completion of the model. However, in-class time will be available after lectures, where students may work on their models with faculty available.

Homework = 30%
Class Project = 70%
- Tree files
- 300-350 word abstract and PowerPoint presentation delivered Session 8 in class

Course Mechanics:

1.0 credit, 2 hours/session, 8 sessions.

The computer classroom has full copies of TreeAge with help documentation on each of the computers. You may choose to do most of your work in the computer lab. However, it is strongly recommended that you download a student version of TreeAge for home use during the course, which is limited to 125 nodes (sufficient for the project), expires in 1 year, and is available for download from TreeAge at a cost of $45. Go to http://server.treeage.com/treeagepro/purchase/stuLic.asp; you must select "student" for License Type and "Download Only" for Delivery. This version is for educational purposes only. We will supply additional handouts as needed.
Session 1  Course overview and TreeAge tutorial

Concepts and Topics:
In this session we will introduce the mechanics of the course and discuss the project assignment, then provide an introduction to the computational aspects of decision modeling and take you through the tutorial using TreeAge Pro Suite. This will include tree construction (branches, nodes, probabilities, values) and tree evaluation (average out/fold back).

Required Reading (during the session)

Session 2  Tree Building and Assigning Health States

Concepts and Topics:
In this session we will discuss basic tree building concepts, assigning health states in a Markov model, and the simplifying assumptions they entail.

Required Reading (prior to session):

Homework: Assign Markov health states for the project – bubble diagram and tree format

Session 3  Mathematical concepts in modeling

Concepts and Topics:
In this session we will discuss mathematical concepts you will have been exposed to in the tutorial: the half-cycle correction, accounting for competing causes of mortality, and rates and probabilities

Required Reading (prior to session):

Homework: Apply half cycle correction and life table mortality into tree

Session 4  Sensitivity Analysis

Concepts and Topics:
This session will cover one-way sensitivity analyses and their use in “de-bugging” trees. Additionally, students will be walked through a method for graphically representing the results of one-way sensitivity analyses in a tornado diagram. Finally, we will review the concept, already introduced in the tutorial, of probabilistic (or 2nd order Monte Carlo) sensitivity analyses.

Required Reading (prior to session):

Homework: Semi-working model
### Session 5  
**Representing uncertainty in CEA results**

**Concepts and Topics:**
Newer techniques, such as acceptability curves, will be discussed as well as challenges for future cost-effectiveness research.

**Required Reading (prior to session):**

### Session 6  
**Value of information analysis**

**Concepts and Topics:**
Value of information analysis and its major product, the expected value of perfect information, will be discussed. This technique shows great promise as an aid for decision making and for future research resource allocation.

**Required Reading (prior to session):**

### Session 7  
**Accounting for future costs**

**Concepts and Topics:**
Handling of “unrelated” future costs of health care, an area of unresolved controversy, will be considered.

**Required Reading (prior to session):**
1. Meltzer D. Accounting for future costs in medical cost-effectiveness analysis. *Journal of Health Economics* 1997;16(1):33-64. (okay to skip Section 2 if you are not mathematically oriented)

### Session 8  
**Student Presentations**

**Concepts and Topics:**
In this session, students will present their findings in a formal PowerPoint presentation (10 minutes maximum) and be critiqued.