Course Directors: Anna N. A. Tosteson, ScD, James Stahl, MD, MPH
Teaching Assistant: Rebecca Smith, MS
Technical Specialist: Stephanie Tapp, PhD

– COURSE INFORMATION –

COURSE FACULTY

PH 121 is directed by Anna N.A. Tosteson, ScD and James Stahl, MD,MPH who may be reached at Anna.Tosteson@Dartmouth.edu and James.E.Stahl@hitchcock.org . The teaching assistant for this course is Rebecca Smith, MS. The teaching team also includes Stephanie Tapp, PhD who will provide technical assistance in model development. Rebecca will provide on-site teaching assistance, while Stephanie will mainly be assisting from afar. Rebecca is a TDI graduate and is now a Project Coordinator with TDI's Comparative Effectiveness Research Program. Stephanie is a TDI Comparative Effectiveness Research Program Fellow. E-mail addresses for Rebecca and Stephanie follow: Rebecca.Smith@Dartmouth.edu, Stephanie.Tapp@Dartmouth.edu,

OFFICE HOURS

Weekly TA office hours will be with time and location TBA. The teaching team will generally be available for questions via e-mail and in-person on class days or by appointment. Drs. Tosteson and Stahl are available by appointment.

Course Learning Objectives [linked to TDI Core Competencies]
1. Explore the disciplines of decision and cost-effectiveness analysis [4,5,6]
2. Conduct a review of relevant literature on a student selected issue [1,6,7,11]
3. Create analytical decision models (simple decision trees, Markov models) able to answer complex decision and cost-effectiveness questions [1,4,6,7,9,11]
4. Apply the use of decision and cost-effectiveness modeling to answer a self-selected question and present it to faculty and peers [1,4,5,6,7,9,10,11,12]

TDI Core Competencies
1. Understand the contributors to health and disease
2. Understand the relationships between health, health care, and public policy
3. Understand the organizations, dynamics, delivery, impact, and financing of health care
4. Understand decision-making and variation in health care
5. Apply and understand statistics, research methods, and quality improvement approaches and measurement of individual, community, and population health
6. Critically evaluate health and health care information from diverse sources with a healthy skepticism by questioning assumptions and considering alternative explanations and conclusions
7. Apply diverse problem-solving skills including the ability to define a question, access appropriate data, apply analytic tools, and combine creativity and systems thinking to generate informed assessments and feasible recommendations
8. Effectively engage stakeholders, manage change, monitor processes, and evaluate outcomes to improve health
9. Communicate professionally, effectively, and persuasively in written, spoken, and visual formats
10. Exercise the skill of listening. Seek, accept, and provide constructive feedback

11. Contribute individually, collaborate effectively, and promote a productive work environment
12. Convey respect for others. Incorporate ethics in decision making, management, and behavior
13. Lead improvement by organizing teams and motivating others with an inspiring, realistic vision

COURSE READINGS
There is one required text:
Hunink M et al. (2014) *Decision making in health and medicine: Integrating evidence and values (2nd edition)*. Cambridge University Press.
An optional text is:
Neumann PJ, Sander GD, Russell LB, Siegel JE, Ganiats TG, eds. (2016) *Cost-effectiveness in health and medicine 2nd edition.* New York, Oxford University Press.
Supplemental required & optional readings are listed in the syllabus. Unless otherwise noted, articles are available through the library electronically (i.e., as pdfs).

REQUIRED SOFTWARE
TreeAgePro Suite (student version) from TreeAge Software. At this writing, TreeAge has agreed to allow student versions for this course to accommodate up to 200 nodes, which should be more than sufficient for class projects. Details on how to obtain this special student version will be (have been) circulated by e-mail.

COURSE STRUCTURE
The course consists of 10 weeks of lecture and lab sessions. Discussion is encouraged during both the lectures and labs, which will be held from 1-5pm each Tuesday **EXCEPT** for the week 9 class which will be held on THURSDAY MAY 23rd from 1-5pm (rather than on Tuesday, May 21st).

HOMEWORK
Weekly assignments are noted in the course syllabus. Assigned material may include exercises from the text, homework sets and project assignments, which will be distributed in class. Unless otherwise noted, completed homework is due the following week at the beginning of class. All PH 121 students are required to complete a decision analysis project as a member of a project team. A series of project assignments will lead students through project identification, definition and development. Both PH 121 and PH 119 students will present final projects orally at the end of the course. PH 119 students typically complete an individual project, but are sometimes paired with another student. All PH 119 students complete an individual paper.

GRADING
Student performance in this course is based on four components. For students in PH 121, components and weighting are as follows: examination (45%), class and lab participation (10%), homework (10%), project (35%). For students in PH 119, more emphasis is given to the project and related paper with weighting as follows: examination (40%), class and lab participation (10%), homework (5%), and project and paper (45%). The examination will be "take home" and "open book." *You are not allowed to work together on the take-home examination.*

Academic Integrity/Honor Code
Upholding the highest standards of academic integrity is a professional obligation. Students are expected to know, abide by, and help preserve the TDI Honor Principle and Academic Code of Conduct, both inside and outside of the classroom. All TDI students receive the Honor Principle and Code of Conduct upon entering the program and must sign an acknowledgment that they

agree to abide by them. Please see the instructor, a teaching assistant, or member of the Office of Educational Programs if you have any questions.

Related Resource: TDI provides access to TurnItIn (anti-plagiarism software) that allows students to check their work (and learn from any mistakes) prior to submission. While it is recommended that students use the software for all work, it is especially encouraged for group work in which each student whose name is on the final product is responsible for the integrity of the entire document. A link to TurnItIn is provided on the Canvas home page.

Disability Services/Accommodations
Students with learning disabilities or other special needs should contact a Course Director at the beginning of the term to arrange for any accommodations that may be necessary. The Course Director will consult with the Associate Director of Education to verify the appropriate level of accommodations.

Sexual Misconduct
At Dartmouth, we value integrity, responsibility, and respect for the rights and interests of others, all central to our Principles of Community. We are dedicated to establishing and maintaining a safe and inclusive campus where all have equal access to the educational and employment opportunities Dartmouth offers. We strive to promote an environment of sexual respect, safety, and well-being. In its policies and standards, Dartmouth demonstrates unequivocally that sexual assault, gender-based harassment, domestic violence, dating violence, and stalking are not tolerated in our community.

The Sexual Respect Website (https://sexual-respect.dartmouth.edu) at Dartmouth provides a wealth of information on your rights with regard to sexual respect and resources that are available to all in our community.

Please note that, as a faculty member, I am obligated to share disclosures regarding conduct under Title IX with Dartmouth's Title IX Coordinator. Confidential resources are also available, and include licensed medical or counseling professionals (e.g., a licensed psychologist), staff members of organizations recognized as rape crisis centers under state law (such as WISE), and ordained clergy (see https://sexual-respect.dartmouth.edu/reporting-support/all-resources/confidential-resources).

Should you have any questions, please feel free to contact Dartmouth's Title IX Coordinator or the Deputy Title IX Coordinator for the Guarini School. Their contact information can be found on the sexual respect website at: https://sexual-respect.dartmouth.edu/reporting-support/all-resources/campus-resources

Session Overviews

Session 1:   **March 26**

    Section A: **Introduction and Overview, Review of Basics**   **Tosteson**
    Section B: **Structuring a Decision Tree**   **Tosteson**

Description: Decision analysis is a discipline for generating the insight necessary to act with confidence in the face of complex, uncertain and dynamic decisions. In this session, we will consider the following questions: what is a decision; who is the decision maker; what is the difference between descriptive and normative decision making; on what basis should decisions be made; how can decision making be best formalized? We then will review and practice how to build and evaluate a simple decision tree. We will also briefly discuss course logistics.

Goals   After this session, students should be able to (1) describe the aims of decision analysis, (2) recognize elements of a "good" decision problem (3) identify the components of a decision tree, (4) structure a simple decision tree, and (5) evaluate a simple decision tree.

Readings: DM Text:[*] Chapters 1 and 2

        Detsky AS, Naglie G, Krahn MD, Naimark D, Redelmeier DA. Primer on medical decision analysis: Part 1—Getting started. Med Decis Making 1997;17:123-125.

Optional: Roberts M, Russell LB, Paltiel AD, Chambers M, McEwan P, Krahn M, et al. Conceptualizing a model: a report of the ISPOR-SMDM Modeling Good Research Practices Task Force-2. Medical Decision Making. 2012;32(5):678-89.

Lab 1:   **Introduction to TREEAGE**   **Smith**
    Tree building exercise

Homework: Project Assignment 1 (to be distributed)
        Homework Set 1 (to be distributed)

Optional problems:[⊕] DM Text Online Exercises (see link below) 1.2 & 1.3

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[*] *Decision Making in Health and Medicine*: *Integrating evidence and values*. Second Edition. MGM Hunink, MC Weinstein, E Wittenberg, MF Drummond, JS Pliskin, JB Wong, PP Glasziou. Cambridge University Press, Cambridge, UK, 2014.

[⊕] Not to be handed in. Exercises and solutions are provided at:
http://www.cambridge.org/gb/academic/textbooks/dmhm/exercises/

Session 2:   **April 2**

      Section A: **Probabilities and Bayes' Theorem**   **Tosteson**
      Section B: **Sensitivity Analysis and Value of Information**   **Tosteson**

      Description: Decision analysis requires the use of probabilities to quantify the likelihood of events and outcomes.   The appropriate use of probabilities in decision analysis involves knowledge of the fundamental laws of probability. In section A, the fundamentals of probability will be introduced and students will learn how to revise the probability of an event based on new information (e.g., test result) using Bayes' Theorem.

                 High-quality decision analysis requires the development of models that represent efficiently the aspects of a decision problem that matter the most.
In section B, we will learn about two powerful tools for focusing attention on those assumptions that matter the most. These tools are *sensitivity analysis* and *value of information analysis*. In addition to focusing attention, value of information analysis allows us to quantify the value of obtaining additional clinical information (e.g., diagnostic testing).

      Goal: After this session, students should be able to (1) use the basic laws of probability, (2) assign probabilities to a decision tree (3) revise probabilities to account for new information, (4) perform a sensitivity analysis on any variable in a decision model, (5) perform value of perfect and imperfect information calculations and (6) interpret the results of sensitivity analyses and value of information calculations.

      Readings: DM Text: Chapters 3, 5, 6

                 Kassirer JP, Pauker SG. The toss-up. N Engl J Med 1981:305:1467-1469.

      Lab 2:   Student Project Pitches based on Assignment 1   **Tosteson& Stahl**

      Homework: Project Assignment 2
                 Homework Set 2

Optional Problems: DM Text Online Exercises 2.4, 3.2, 3.4, 5.2, 6.1, 6.2, 6.4

Session 3:   **April 9**

    Section A: **Parameter Estimation I: Valuing**
                                   Outcomes   **Tosteson**

    Section B: **Parameter Estimation I (cont'd): Valuing Health for CEA**   **Tosteson**

Description: Decision analysis requires that we account for alternatives, uncertainties and preferences. In section A, we present the concept of utilities as a means to quantify preferences for health outcomes. We will discuss various metrics for quantifying preferences, including standard gamble, time tradeoff, and rating scales. Advantages and limitations of each approach, will be discussed. In section B, we focus on health valuation for purposes of economic evaluation. We will contrast direct utility assessment with use of preference classification systems.

Goal: After this session, students should be able to (1) explain the role of utility assessment in decision analysis, (2) describe the different preference metrics, (3) perform a simple utility assessment on a subject, and (4) understand the options available for assessing health outcomes in economic studies.

Readings: DM Text: Chapter 4
McDonough C, Tosteson, ANA. Measuring preferences for cost-utility analysis: How choice of method may influence decision-making. Pharmacoecon 2007;25(2):93-106.

Optional: CEHM ♣ *:* Chapter 7

McNeil BJ, Pauker SG, Sox HC Jr., Tversky A. On the elicitation of preferences for alternative strategies. N Engl J Med 1982;306:1259-1262.

Detsky AS, Naglie G, Krahn MD, Redelmeier DA, Naimark D. Primer on medical decision analysis: Part 2. Med Decis Making 1997;17:126-135.

Fryback DG, Dunham, Palta M, Hanmer J, Buechner J, Cherepanov D, Herrington SA, Hays RD, Kaplan RM, Ganiats TG, Feeny D, Kind P. US norms for six generic health-related quality-of-life indexes from the National Health Measurement Study. Medical Care 2007;45:1162-1170.

Sullivan PW, Lawrence WF, Ghushchyan V. A national catalog of preference-based scores for chronic conditions in the United States. Medical Care 2005;43:736-749.

Franks PP, Hanmer J, Fryback DG. Relative disutilities of 47 risk factors and conditions assessed with seven preference-based health status measures in a national US Sample: Toward consistency in cost-effectiveness analysis. Med Care 2006;44:478-485.

    Lab 3   **Analyses involving valued outcomes.**

Homework: Homework Set 4   (due April 16)

Project Assignment 3 (due April 23 in 2 weeks)

♣ *Cost-Effectiveness in Health and Medicine 2nd Edition* Neumann PJ, Sander GD, Russell LB, Siegel JE, Ganiats TG. Oxford University Press, New York, 2016.

Session 4:   **April 16**

Sections A / B: **Markov Models**   **Tapp**

Description: In this session, Markov models will be introduced and we will discuss the use of decision analysis in medical practice and health policy. Markov models are a class of mathematical models that are useful when events happen repeatedly over time and/or when the timing of events is important. Such models have been used to evaluate a variety of health programs and interventions. In this session, the basic features of the Markov model will be introduced.

Goal: After this session, the student should be able to (1) identify situations where a Markov model would be useful, (2) define the Markov property, (3) feel comfortable reading papers that involve use of Markov models, and (4) be able to perform simple Markov analyses using computer software. The student should also be able to address the limitations and advantages of decision analysis and critically appraise the use of decision analysis in a variety of applications.

Readings: DM Text: Chapter 10; TREEAGE Manual 2015, Chapters 34 & 35

Sonnenberg FA, Beck JR. Markov Models in Medical Decision Making: A Practical Guide. Med Decision Making 1993;13:322-338.
DOI:10.1177/0272989X9301300409

Birkmeyer JD, Marrin CS, O'Connor GT. Should patients with Bjork-Shiley valves undergo prophylactic replacement? Lancet 1992;340:520-23.

Optional: Finlayson SRG, Birkmeyer JD, Fillinger MF, Cronenwett JL. Should endovascular surgery lower the threshold for repair of abdominal aortic aneurysms? Journal of Vascular Surgery 1999; 29:973-85. *(@dartmouth.edu/~biomed)*

Siebert U, Alagoz O, Jahn B, Owens DK, Cohen DJ, Kuntz KM. State-transition modeling: A report of the ISPOR-SMDM Modeling Good Practices Task Force-3. Med Decis Making September-October 2012; 32:690-700.
Available here: *http://mdm.sagepub.com/content/32/5/690.full.pdf+html*

Lab 4   **Markov Modeling Exercise**
Homework: Homework Set 4

Optional Problems: DM Text Exercises online 10.1, 10.2, 10.3 (recommended especially for folks who are doing a project that involves a Markov model)

Session 5   **April 23**

Sections A & B: **Cost-Effectiveness Analysis I: Review of Resource Allocation, Discounting, and CE**
Measures   **Tosteson**

Description: In our society of limited resources, many clinical and health policy decisions involve an important economic component. Cost-effectiveness analyses address the issue of "value for money" by estimating cost per unit of outcome. Such analyses are increasingly common in the medical literature. In sections A & B, discounting and basic measures of cost-effectiveness will be reviewed. The use of cost-effectiveness analysis for resource allocation will also be discussed.

Goal: After this session, the student should be able to (1) compute the present value of a cost incurred in the future, (2) complete and interpret an incremental cost-effectiveness analysis, and (3) allocate a limited set of resources among competing programs on the basis of cost-effectiveness data.

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Readings: DM Text: Chapter 9

                  Frazier AL, Coditz GA, Fuchs CS, Kuntz KM. Cost-effectiveness of screening for colorectal cancer in the general population. JAMA 2000;284:1954-1961. *(@dartmouth.edu/~biomed)*

Optional: Neumann PJ, Cohen JT, Weinstein MC. Updating cost-effectiveness- The curious resilience of the $50,000-per-QALY threshold. N Engl J Med 2014;371;796-797.

                  Chapman RH, Stone PW, Sandberg EA, Bell C, Neumann PJ. A comprehensive league table of cost-utility ratios and a sub-table of "panel-worthy" studies. *Med Decis Making* 2000;20:451-467.

                  Moran AE, Odden MC, Thanataveerat A, Tzong KY, Rasmussen PW, Guzman D, Williams L, Bibbins-Domingo K, Coxson PG, Goldman L. Cost-effectiveness of hypertension therapy according to 2014 guidelines. N Engl J Med 2015;372(5):447-55.

                  Cohen JT, Neumann PJ, Weinstein MC. Does preventive care save money? Health economics and the presidential candidates. New Engl J Med 2008;358:661-663.

                  Clement FM, Harris A, Li JJ, Young K, Lee KM, Mann BJ. Using effectiveness and cost-effectiveness to make drug coverage decisions: A comparison of Britain, Australia, and Canada. JAMA 2009;302:1437-1443.

Optional Text: CEHM ♣ : Ch 2, Ch 3, Ch 4, Ch 10

Lab 5   Critiques of 1st draft model structures   **Stahl & Tosteson**

Homework: Homework Set 5

♣ *Cost-Effectiveness in Health and Medicine 2nd Edition* Neumann PJ, Sander GD, Russell LB, Siegel JE, Ganiats TG. Oxford University Press, New York, 2016.

Project Assignment 4 (Due Session 6, April 30)

Session 6   **April 30**

     Section A: **CEA II: Cost Estimation and CEA in TreeAge**   **Tosteson & Smith**
     Section B: **Homework Review**   **Smith**

Description: In section A, we will focus on the use of cost as an endpoint (numerator of incremental cost-effectiveness ratio). This will include a discussion of different types of cost and cost measurement. In section B, we will focus on understanding how to conduct and interpret cost-effectiveness analyses using the TreeAge software package. To make sure that all are ready for today's take-home exam, we will review and discuss any questions pertaining to Homework Set 5.

                                The lab provides an opportunity for students to complete a realistic decision analysis. It will provide an opportunity to review course material and to complete a cost-effectiveness analysis (i.e., structuring a decision as a tree, probability revision, use of sensitivity analysis and cost-effectiveness analysis).

Goal: After this session, students should be able to (1) distinguish between direct and indirect costs, (2) distinguish between costs and charges, (3) describe methods for estimating costs, (4) understand how to conduct and interpret cost-effectiveness analyses within the TreeAge software package.

Readings: DM Text Chapter 9*; TREEAGE Manual 2015, Chapter 31*

Optional: CEHM, Chapter 8, Chapter 10, Chapter 13

Lab 6   **Putting it all together.**

Homework: EXAM DISTRIBUTED due May 7 at beginning of class.

Session 7:   **May 7**

    Section A: **Parameter Estimation II: Use of databases & estimating**
                    life expectancy   **Tosteson**
    Section B: **Databases/Tables & Tolls in TreeAge**   **Smith**

Description: In this session, we will discuss the role and potential pitfalls of utilizing databases to estimate decision model parameters. Particular problems with observational databases will be highlighted. In addition, we will consider how to estimate patient-specific life expectancy and quality-adjusted life expectancy based on life tables and data provided in the literature. The use of life tables within TreeAge to estimate life-expectancy, quality-adjusted life expectancy and discounted life expectancy will also be discussed.

Goal: After this session, students should be able to (1) understand the potential pitfalls and challenges inherent in using observational databases to estimate model parameters, (2) estimate life-expectancy based on data obtained from the literature and (3) understand practical aspects of how to use tables to generate patient-specific life expectancies in TreeAge.

Readings: Tosteson ANA, Goldman L, Udvarhelyi IS, Lee TH. Cost-effectiveness of a coronary care unit versus an intermediate care unit for emergency department patients with chest pain. Circulation 1996; 94:143-150.

Optional:

      Beck JR, Kassirer JP, Pauker SG. A convenient approximation to life expectancy (The "DEALE"): I. Validation of the Method. Am J Med 1982;73:883-888. *(@ Dartmouth.edu/~biomed)*

      Beck JR, Pauker SG, Gottlieb JE, Klein K, Kassirer JP. A convenient approximation of life expectancy (The "DEALE"): II. Use in medical decision making. Am J Med 1982:73:889-899.

Optional Text: DM Text: Chapter 8 and CEHM: Chapter 6

Lab 7:   **Project Development**

      Focus on several projects for discussion/ group learning

Homework: Project Assignment 5 (due May 14)

Session 8:   **May 14**

Section A: **Model**
                              Validation

                                                                                          Stahl

Section B: **Handling Uncertainty in Model-Based Analyses**   **Stahl**

Description: In this session, we will address model validation. In section B, we will examine
                     further approaches to handing uncertainty in model-based cost-effectiveness
                     analyses.

Goal: After this session, the student should understand approaches to model validation, and
                     (3) approaches to assessing uncertainty in model-based analyses.

Readings: DM Text: Chapters 11 and 12

                     Stahl JE. Trust and recognition: coming to terms with models. Med Decis Making
                     2015;35:136-8. doi: 10.1177/0272989X14563080

                     Eddy DM, Hollingworth W, Caro JJ, Tsevat J, McDonald KM, Wong JB on Beahlf
                     of the ISPOR SMDM Modeling Good Research Practices Task Force. Model
                     Transparency and Validation: A Report of the ISPOR-SMDM Modeling Good
                     Research Practices Task Force. Value in Health 2012; 15:843-850.

                     Stahl JE. Modelling methods for pharmacoeconomics and health technology
                     assessment: an overview and guide. Pharmacoeconomics 2008;26:131-48.

Optional: TREEAGE Manual 2015, Chapters 32 and 33.

                     Grutters JPC, Sculpher M, Briggs AH, Severens JL, Candel MJ, Stahl JE,
                     DeRuysscher D, Boer A, Ramaekers BLT, Joore MA. Acknowledging patient
                     heterogeneity in economic evaluation: A systematic literature review.
                     Pharmacoeconomics 2013;31:111-123.

Optional Text: CEHM: Chapter 11

Lab 8:   **Mini-RIPs/Project Development**   **Stahl &Tosteson**
                     Focus on several projects for discussion/ group learning

Homework: Project Assignment 6

Session 9:   **May 23 **A THURSDAY****

Section A: **Diagnostic Technology Assessment**   **Tosteson**

Section B: **Technology Assessment with and without Constraints**   **Stahl**

Description: In section A, students will learn how to evaluate diagnostic tests with receiver operating characteristic (ROC) curves and potential biases in diagnostic test assessment will also be discussed. In section B, students will learn the impact of real world constraints on outcomes associated with new technology.

Goal: After this session, students should be able to (1) understand how to construct and interpret an ROC curve, (2) identify potential biases in diagnostic test assessment, and (3) understand alternative modeling approaches and outcomes measures for assessing new technologies.

Readings: DM Text: Chapter 7

Begg CB. McNeil BJ. Assessment of radiologic tests: control of bias and other design considerations. Radiology 1988;167:565-569.

Tosteson ANA, Stout NK, Fryback DG, Acharyya S, Herman B, Hannah L, Pisano E. Cost-effectiveness of digital mammography breast cancer screening. Ann Intern Med 2008;148:1-10.

Stahl JE, Furie KL, Gleason S, Gazelle GS. Stroke: Effect of implementing and evaluation and treatment protocol compliant with NINDS recommendations. Radiology 2003:228:659-68.

Stahl JE, Vacanti JP, Gazelle S. Assessing emerging technologies- the case of organ replacement technologies: volume, durability, cost. Int J Technol Assess Health Care 2007:23:331-6.

Optional

Pisano ED, Gatsonis C, Hendrick E, Yaffe M, Baum JK, Acharyya S, et al.; Digital Mammographic Imaging Screening Trial (DMIST) Investigators Group. Diagnostic performance of digital versus film mammography for breast-cancer screening. N Engl J Med. 2005;353:1773-83.

Stahl JE, Sandberg WS, Daily B, Wiklund R, Egan MT, Goldman JM, Isaacson KB, Gazelle S, Rattner DW. Reorganizing patient care and workflow in the operating room: A cost-effectiveness study. Surgery 2006;139:717-28.

Lab 9:   **Mini-RIPS/ Project Development**   **Stahl &Tosteson**

Homework: Final Project Assignment- Due May 28th

Session 10　　　　　　　　**May 28**

　　Sections A & B & Lab:　PH 121 Final Student Project Presentations　　　　　　　　**Stahl &**
Tosteson

　　　Homework:　　　Note that the final project paper is due for PH 119 students no later than Friday, May
　　　　　　　　　　　31 at 5 pm.

COURSE CALENDAR FOR PH 121/119: DECISION ANALYSIS/ SPRING QUARTER 2019*
Professors Anna Tosteson and James Stahl

SESSION*	Section A	Section B	Lab	Projects/ Homework **
Session 1: March 26	Course Overview/ Review of Basics	Structuring Decision Problems	Lab 1: Intro to TreeAge/ Tree building and Evaluation	Project Assignment 1: Identify a Problem Homework Set 1 (Due Session 2)
Session 2: April 2	Probabilities and Bayes' Theorem	Sensitivity Analysis	Lab 2: Project Pitches- Discussion of Project Assignment 1	Project Assignment 2: Project Background Reading Homework Set 2 (Due Session 3)
Session 3: April 9	Parameter Estimation I: Valuing Outcomes	Parameter Estimation I (Cont'd): Valuing Health for Cost-effectiveness Analysis	Lab 3: Sensitivity Analyses	Project Assignment 3: Define Model Structure (Due Session 5—in 2 weeks) Homework Set 3 (Due Session 4)
Session 4: April 16	Markov Models	Markov Models (cont'd)	Lab 4: Markov Models	Homework Set 4 (Due Session 5)
Session 5: April 23	CEA I: Resource Allocation, Discounting, & CE Measures	Lab 5: Critiques of Model Structures	Critiques of Model Structures (cont'd)	Project Assignment 4: Model Revision, Identify/link all relevant parameters (Due Session 6) Homework Set 5 (due session 6)
Session 6: April 30	CEA II: Estimating Costs	CEA II (cont'd): CEA in TreeAge & Homework Review	Lab 6: Putting it all Together	TAKE-HOME EXAM DISTRIBUTED- Due Session 7
Session 7: May 7	Parameter Estimation II: Use of data bases and estimating life expectancy	Tables & Tolls in TreeAge	Lab 7: Project development	Project Assignment 5: Model Development / estimate parameters, debug, analyze & interpret
Session 8 May 14	Model Validation	Handling Uncertainty in Model-based Analyses	Lab 8: Mini-RIPS/ Project development	Project Assignment 6: Model Development/ revision & analysis continues
Session 9: May 23 Thurs 1-5PM	Diagnostic Technology Assessment	Technology Assessment with and without Constraints	Lab 9: Mini-RIPS/Project development	Project Assignment 7: Presentation Preparation
Session 10 May 28	Student Presentations	Student Presentations	Student Presentations	