Health Care Management Science – BUS 9882B

2014 Course Syllabus (subject to change)
January 6 2014

Instructor:

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Course Description:

This course will focus on a number of topics that make up the field of health care management science.

Course Logistics:

Location: Ivey
Hours: Monday and Wednesday, 10:00-11:20

The class meets twice a week for 80 minutes per class. Classes will be a mixture of lectures led by the instructor and seminar style classes in which class participants lead the discussion of a research paper.

Topics covered:

The course will cover the following main topics:

1. Disease models and cost effectiveness analysis.
2. Resource allocation for control of infectious diseases.
3. Incentives and insurance.
4. Pharmaceutical risk sharing.
5. Queuing and simulation

6. Sequencing and scheduling.
7. Markov decision processes.
8. Coordinating the vaccine supply chain.

Grading:

20% Class contribution
15% Leading discussions of research articles
20% Homework assignments
20% Exam
25% Final project (Report and presentation)

Grading component description:

Class Contribution: Students are expected to actively participate and contribute to the class-room discussion. Students are therefore required to have read the required reading and prepared questions and discussion points to share with their classmates.

Leading Article Discussion: Each week we will discuss one or more research articles on class topics. The number of discussions that each student leads will depend on the size of the class. The discussion should include a description of the problem, motivation, brief literature review, model framework, assumptions, analysis/results explanation, and future work or extensions.

Homework Assignments: There will be 4 written homework assignments throughout the term. Late assignments are not accepted.

Exam: There will be an in-class exam at the end of the term.

Final project: Each student will write a 2500-3000 word report, and give an in-class presentation at the end of the term. The report will consist of a brief literature review of a topic related to health care management science and a formulation of a model that could extend this literature stream.

A 1-2 page interim report is due mid-way through the term.

Plagiarism:

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Website: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf

Students must write their essays and assignments (at Ivey this includes case exams and reports) in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see Scholastic Offense Policy in the Western Academic Calendar).

All required papers (at Ivey this includes case exams and reports) may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (hyperlink www.turnitin.com).

For more information see:
http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf

Course Material:

Course material will consist of a mix of journal articles and book chapters which are available through Western Libraries.

A detailed reading list will be supplied at the beginning of the term.

Reading List:

Class	Date	Topic	Sub-Topic	Readings
1	Jan 6	Course Overview Introduction to disease models and cost effectiveness analysis	Intro/Overview	Inadomi JM, Decision analysis and economic modelling: a primer, Eur J Gastroenterol Hepatol 16:535–542, 2004. Provenzale D, An overview of economic analysis for the practicing gastroenterologist and hepatologist, Eur J Gastroenterol Hepatol 16:513–517, 2004.
2	Jan 8		Trees	Cipriano LE, Rupar CA, Zaric GS, The cost-effectiveness of expanding newborn screening for up to 21 inherited metabolic disorders using tandem mass spectrometry: results from a decision-analytic model, Value in Health, 2007, 10(2): 83-97. Cipriano, LE, Barth WH Jr., Zaric GS, The cost effectiveness of routine screening for vasa previa at 18-20 weeks gestation, British Journal of Obstetrics and Gynecology, 2010, 17(9):1108-18. Hussereau et al, Consolidated Health Economic Evaluation Reporting Standards (CHEERS) statement., BMC Med, 2013, 11:80.
3	Jan 13		Markov Models	Gould et al, Cost-effectiveness of alternative management strategies for patients with solitary pulmonary nodules, Ann Intern Med, 2003, 138(9): 724-35. Cao et al, Systematic review of the cost-effectiveness of positron-emission tomography in staging of non--small-cell lung cancer and management of solitary pulmonary nodules., Clin Lung Cancer, 2012, 13(3): 161-70. Seibert et al, State-transition modeling: a report of the ISPOR-SMDM Modeling Good Research Practices Task Force-3, Medical Decision Making, 2012, 32(5): 690-700.
4	Jan 15		Infectious Disease Models	Long et al, Potential Population Health Outcomes and Expenditures of HIV Vaccination Strategies in the United States, Vaccine, 2009, 27(39), 5402-5410. Long et al, The cost-effectiveness of a modestly effective HIV vaccine in the United States, Vaccine, 2011, 29(36): 6113-24.

				Pitman et al, Dynamic transmission modeling: a report of the ISPOR-SMDM Modeling Good Research Practices Task Force Working Group-5, Medical Decision Making, 2012, 32(5): 712-21.
5	Jan 20		PSA and VOI	TBD
6	Jan 22		Optimization Rationale	"From cost effectiveness analysis to resource allocation – where to draw the line?", Ch. 5 in Valuing Health Care, F Sloan (ed.), 1995. Debate: Birch, Gafni, Cost effectiveness/utility analyses. Do current decision rules lead us to where we want to be?, JHE, 1992, 11(3), 279-96. Johannesson, Weinstein, On the decision rules of cost-effectiveness analysis., JHE, 1993, 12(4), 459-67. Birch, Gafni, Changing the problem to fit the solution: Johannesson and Weinstein's (mis) application of economics to real world problems, JHE 1993, 12(4), 469-76.
7	Jan 27		Formal Resource Allocation Models	Lasry et al, "A model for allocating CDC's HIV prevention resources in the United States.", Health Care Management Science, 2011, 14(1): 115-24. Lasry et al, "Allocating HIV prevention funds in the United States: recommendations from an optimization model.", PLoS One, 2012, 7(6): e37545.
8	Jan 29	Markov Decision Processes and Dynamic Programming		O. Alagoz, L. M. Maillart, A. J. Schaefer and M. S. Roberts (2004), "The Optimal Timing of Living-Donor Liver Transplantation," Management Science, 50(10), p.1420-1430. Modeling medical treatment using Markov decision processes, Schaefer et al., in Operations Research and Health Care: A Handbook of Methods and Applications, Ch. 23, p. 593, Brandeau, Sainfort and Pierskalla (eds.), International Series in Operations Research & Management Science (Book 70), Springer 2004.
9	Feb 3			Yang et al, Analyzing Screening Policies for Childhood Obesity, Management Science, 2013, 59 (4): 782-795.
10	Feb 5	Healthcare Operations Management	Discrete Event Simulation	Paul, Sharoda A.; Reddy, Madhu C.; DeFlitch, Christopher J, A Systematic Review of Simulation Studies Investigating Emergency Department

				Overcrowding, Simulation-Transactions of the society for modeling and simulation international Volume: 86 Issue: 8-9 Pages: 559-571 DOI: 10.1177/0037549710360912 Published: AUG 2010. Blake JT, Carter MW, Richardson S, "An analysis of emergency room wait time issues via computer simulation", 1996, INFOR, 34(4), Pages: 263-273.
11	Feb 10		Queuing and Delays in Health Care	Queueing Models for Healthcare Operations, D Gupta, Ch 2, p. 19 of Handbook of Healthcare Operations Management: Methods and Applications (International Series in Operations Research & Management Science), B Denton (ed.), International Series in Operations Research & Management Science (Book 184), Springer, 2013. Green, Soares, Giglio, Green, Using Queueing Theory to Increase the Effectiveness of Emergency Department Provider Staffing, Acad Emerg Med, 2006; 13:61–68. (also read online appendix, available here: http://onlinelibrary.wiley.com/doi/10.1197/j.aem.2005.07.034/suppinfo)
12	Feb 12			TBD
13	Feb 24		Managing the Blood Supply	Supply chain management of blood banks, W Pierskalla, in Operations Research and Health Care: A Handbook of Methods and Applications, Ch. 5, p. 103, Brandeau, Sainfort and Pierskalla (eds.), International Series in Operations Research & Management Science (Book 70), Springer 2004. Zhou et al, Inventory Management of Platelets in Hospitals: Optimal Inventory Policy for Perishable Products with Regular and Optional Expedited Replenishments, M&SOM, Fall2011, Vol. 13 Issue 4, p420-438.
14	Feb 26		Empirical Health Care Operations Management	Song, Tuccker, Merrell, The Diseconomies Of Queue Pooling In a Discretionary Task Setting : An Empirical Investigation of Emergency Department Length of Stay, 2013 (Working Paper) http://www.hbs.edu/faculty/Publication%20Files/13-079_ca3d7c0b-3ba8-4ac6-94b4-9d46f30cb0d4.pdf
15	Mar 3			The Modeling, Analysis, and Management of Intensive Care Units, Bountourelis et al., Ch 6, p. 153 of Handbook of Healthcare Operations Management: Methods and Applications, B Denton (ed.), International Series in

				Operations Research & Management Science (Book 184), Springer, 2013. Kim et al, ICU Admission Control: An Empirical Study of Capacity Allocation and its Implication on Patient Outcomes, Working paper (available from SSRN).
16	Mar 5		Surgery Scheduling	Optimization in Healthcare Delivery Modeling: Methods and Applications, Batun and Begen, Ch 4, p. 75 of Handbook of Healthcare Operations Management: Methods and Applications, B Denton (ed.), International Series in Operations Research & Management Science (Book 184), Springer, 2013. Patient Appointments in Ambulatory Care, Gupta and Wang, in Handbook of Healthcare System Scheduling, R Hall (ed.), International Series in Operations Research & Management Science Volume 168, 2012, Ch. 4, pp 65-104.
17	Mar 10	Insurance	Optimal Insurance	Chapter 6 “Optimal design of health insurance contracts” from Zweifel and Breyer, Health Economics, 1997. Rothschild and Stiglitz, Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information, The Quarterly Journal of Economics, Vol. 90, No. 4, (Nov., 1976), pp. 629-649. Newhouse et al, Some interim results from a controlled trial of cost sharing in health insurance, N Engl J Med. 1981 Dec 17;305(25):1501-7.
18	Mar 12		Defensive Medicine	Montanera, The Importance of Negative Defensive Medicine in the Effects of Malpractice Reform. (Working Paper)
19	Mar 17	Risk Sharing		Adamski et al, Risk sharing arrangements for pharmaceuticals: potential considerations and recommendations for European payers, BMC Health Service Research, 2010, 10:153. Barros et al, The simple economics of risk-sharing agreements between the NHS and the pharmaceutical industry, Health Econ, 2011, 20(4), 461-70. Antonanzas et. al, Should health authorities offer risk-sharing contracts to pharmaceutical firms? A theoretical approach., Health Econ Policy Law, 2011, 6(3): 391-403.

20	Mar 19			Zhang et al, Optimal design of a pharmaceutical price-volume agreement under asymmetric information about expected market size, Production and Operations Management, 2011, 20(3):334–346.
21	Mar 24	Vaccine Supply Chain		Chick, S.E., H. Mamani, and D. Simchi-Levi, Supply Chain Coordination and Influenza Vaccination. Operations Research, 2008. 56(6): p. 1493-1506.
22	Mar 26			Arifoglu, K., S. Deo, and S.M.R. Iravani, Consumption Externality and Yield Uncertainty in the Influenza Vaccine Supply Chain: Interventions in Demand and Supply Sides. Management Science, 2012. 58(6): p. 1072-91.
23	Mar 31	Working with Policy Makers		Blake et al, Evaluating Health Care Policy Decisions: Canadian Blood Services in Atlantic Canada, Ch. 17, p. 365-398, In Operations Research and Health Care Policy G Zaric (ed.), International Series in Operations Research & Management Science (Book 190), Springer, 2013. Hoch, Improving the efficiency of cost effectiveness to inform policy decisions in the real world: Lessons from the pharmacoeconomics research unit at Cancer Care Ontario, Ch. 18, p. 399-416, In Operations Research and Health Care Policy G Zaric (ed.), International Series in Operations Research & Management Science (Book 190), Springer, 2013.
24	Apr 2	Final Project Presentations		