



M.S. HEALTHCARE SYSTEMS MANAGEMENT PROGRAM

SYLLABUS FOR - IE 699 Healthcare Performance and Quality Modeling (Fall 2013)

Class meets

GITC 5601

Wednesdays 6-9pm

Instructor: Dr. Shivon Boodhoo

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Office: ECEC 235

Office Hours: M-R 11am – 12pm

Appointments: (Faltz@njit.edu or 973-596-3510)

COURSE DESCRIPTION

Techniques for modeling and evaluating the performance of healthcare operating units, understanding why they perform as they do, designing new or improved operating procedures and systems for competitive advantage, and managing the work force. Application of classical operations research and systems modeling tools to healthcare systems (healthcare operations studied include hospitals, emergency rooms, diagnostic facilities and physician offices). The course will use a project and reference research oriented approach to achieve student learning.

PREREQUISITE KNOWLEDGE:

An understanding of the U.S. healthcare delivery system and ability to evaluate and apply the mathematical tools and techniques of classic systems engineering.

LEARNING OBJECTIVES: Demonstrated ability to use the tools and techniques of systems engineering to solve healthcare delivery problems by identifying cost drivers, quality determinants, patient satisfaction metrics etc. and recognize opportunities for quality and operations performance improvement.

COURSE ASSESSMENT CRITERIA: Total = 200 pts = 100%

Grades are based on individual and team performance as follows:

30pt Homework #1

30pt Homework #2

50pt Exam 1

50pt Exam 2

40pt Group Project - Presentation (10 min) & Term Paper (submit online)

Homework: Will be based on the course text/case studies and lecture. This is an individual effort and must be done without collaboration unless otherwise instructed. Homework will be submitted to the course Moodle website before the day and time it is due with late submissions counted as a zero.

Exams: Will be based on the course text/case studies and lecture. This is an individual effort and must be done without collaboration. The exam will be closed-book and closed-notes. Calculators with no memory function are the only devices allowed in the exam room. No cell phones or computers allowed. Exams will be during class time and no make-up exams will be given unless a note is

received by the instructor from the Dean of Students office. A missed exam will be counted as a zero.

Group Project: (Team size to be determined by number of students in class). Each team must choose hospitals from the state of NJ (dataset will be provided – minimum no. of hospitals = no. group members) then use the material learned in the course to demonstrate applications of systems engineering tools in a healthcare setting i.e. perform operational performance measurement on the hospital set. The team will identify key performance indicators, cost drivers, quality determinants and patient satisfaction metrics as well as perform future planning. The team will do an in-class ten minute PowerPoint presentation (all members must be present) and submit a ten page minimum, Times New Roman 12 font, 1.5 line spacing, 1 inch margins, (page count excludes pictures and graphs) term paper based on the project (one paper for the group with a work breakdown structure to show individual contributions). The paper must include key concepts from each lecture to demonstrate mastery over the subject matter. Group members and hospitals should be determined within the first two class meetings and all members should subscribe to the *Wall Street Journal*, as the HW, Exam and Project will expect insightful comments that reflect an understanding of economic considerations both local and global as it relates to the subject.

COURSE MATERIALS

Course lectures slides and case study materials: moodle.njit.edu

(1) *Fundamentals of the U.S. Health Care: Principles and Perspectives* by Yesalis, Politzer and Holt (2012) ISBN: 142831735X

(2) Systems Engineering Handbook -
<http://www.inpe.br/twiki/pub/Main/MarceloEssado/SEHandbookv3.pdf>

(3A) *Improving Healthcare Using Toyota Lean Production Methods: 46 Steps for Improvement* by Robert Chalice 2007 ISBN: 0873897137

(3B) National Institute of Health Case Studies: *Applying Systems Engineering Principles in Improving Health Care Delivery* by Kopach-Konrad, Lawley, et al
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2150611/>

(4) *An Introduction to Quality Assurance in Health Care* by Avedis Donabedian 2002 ISBN: 0195158091

(5) To order *Wall Street Journal*: Go to <http://www.wsj.com/studentoffer>
Cost = \$1 per week for the semester

(6) *Engineering a Learning Healthcare System*
<http://www.iom.edu/Reports/2011/Engineering-a-Learning-Healthcare-System.aspx>

(7) ED Simulation paper example - http://imgpublic.mci-group.com/ie/ICEM2012/Thursday/track8/John_McInerney.pdf

Sample process maps - <https://www.premierinc.com/wps/wcm/connect/cf3b5da9-dd1b-4782-b623-dc5ea88a52bc/eCARE+Process+Map.pdf?MOD=AJPERES>

White paper on Healthcare process maps - http://ie.technion.ac.il/serveng/Lectures/Hall_Flows_Hospitals_chapter1text.pdf

(8) *Harvard Business Review Case Study: Paperless healthcare: Progress and challenges of an IT-enabled healthcare system*
<http://hbr.org/product/paperless-healthcare-progress-and-challenges-of-an/an/BH373-PDF-ENG?N=4294958507&Ntt=Healthcare&Nao=10>

(9) Recommended reading: Articles in *New Yorker Magazine* and the books “*Better*,” “*Complications*” and “*Checklist Manifesto*” by Atul Gawande

(10) Institute of Medicine: *Crossing the Quality Chasm*
http://www.nap.edu/html/quality_chasm/reportbrief.pdf

COURSE OUTLINE

Week	MATERIAL	TOPIC	(Project Progress)
1. (Sep 4 th)	Text 1	Overview of the U.S. Healthcare System	
	Acuity level and types of care Stakeholders and Payers Cost sharing in Accountable Care Organizations	HIPAA Regulations ARRA Legislation and Impact H-CAHPS	
2. (Sep 11 th)	Text 2	Classic Systems Engineering	(Groups Formed)
	Basics of systems engineering		
3. (Sep 18 th)	Texts 3A & 3B	Healthcare Systems Engineering	(Hospitals chosen)
	Overview of Healthcare Systems Engineering: (1) Clinical, Public Policy, and Financial (classic) vs (2) Operational Efficiency		
4. (Sep 25 th)	Text 4	Healthcare Quality	(WSJ Economic considerations)
	Avedis Donabedian (father of Healthcare Quality) A Systems Approach to Quality (1) Structure (2) Process (3) Outcomes		
5. (Oct 2 nd)	Text 6	Homework 1	
	Case Study Set 1: Airline Safety, Alcoa See also: <i>Checklist Manifesto</i>		
6. (Oct 9 th)	INFORMS CONFERENCE	Exam 1	

Week	MATERIAL	TOPIC	(Project Progress)
7. (Oct 16 th)	Text 7 Simulation Lab: <i>Design an Efficient Emergency Room</i>		
8. (Oct 23 rd)	Journal Articles (drafts to be posted in Moodle) Introduction to HOSx: Hospital Operations Performance Excellence Model	Guest: Prof Das	
9. (Oct 30 th)	Text 7 Simulation Lab: <i>Scale up Emergency Room to classroom</i> (Value stream mapping exercise)		
LAST DAY TO WITHDRAW FROM COURSES: November 4TH (MONDAY) Spring registration begins			
10. (Nov 6 th) EMR/EHR	Text 8 Cost Estimating	Health IT Decision Support Systems	
11. (Nov 13 th)	Text 6 Case Study Set 2: Veteran's Health Affairs, Ascension Health	Homework 2	
12. (Nov 20 th)		Scorecards <i>(Company KPIs)</i>	
	The Balanced Scorecard Key Performance Indicators		
13.	Nov 27th - No class; Friday schedule		
14. (Dec 4 th)	Text 10 IOM: Crossing the Quality Chasm Healthgrades, Leapfrom Group, U.S. News & World Report	Healthcare Benchmarking	
15. (Dec 11 th)	Project Presentations - Group Project presentations in class - Group Project paper to be submitted by email December 12 th Exam 2 during Final Exam period Dec 13 th to 19 th		

Academic Integrity: The University's academic integrity code will be strictly enforced and all suspected violations will be referred to the Dean of Students office. Details can be found at (<http://www.njit.edu/academics/pdf/academic-integrity-code.pdf>)