


<b>Course Title</b>	<b>Quality Improvement in Healthcare - Lean Six Sigma and Beyond</b>		
<b>Course Number</b>	<b>HMG</b>	<b>6332-5U1</b>	
<b>Professor</b>	<b>Kannan Ramanathan</b>		
<b>Term</b>	<b>Summer</b>	<b>2015</b>	
<b>Meetings</b>	<b>Tuesday 6pm - 10pm</b>		
<b>Classroom</b>	<b>SOM</b>	<b>12.214</b>	

**Professor's Contact Information**

<b>Office Phone</b>	<b>(972) 883-5953</b>
<b>Office Location</b>	<b>SOM 2.615</b>
<b>Email Address</b>	<b>Kannan.Ramanathan@UTDallas.Edu</b>
<b>Office Hours</b>	<b>WED 4:30-5:30 pm</b>

**Teaching Assistant** **There is no Teaching Assistant for this course**

**General Course Information**

**Pre- Co- requisites** **HMG** 6320 The American Healthcare System

**Course Description**

This course uses the Lean Six Sigma framework to teach how healthcare organizations can minimize errors in healthcare delivery and focus on continuous improvement. Lean manufacturing/service focuses on improving the speed of a process and the elimination of waste, primarily by reducing non-value-added steps. Six Sigma deals with the effectiveness with which a process meets customer requirements and is free of defects. The graduate course covers these topics with an emphasis on analytical methods.

Please note that this is NOT a project-based course; i.e., the course requirements do not include the completion of a project.

If you complete HMG 6320 (The American Healthcare System), HMG 6321 (Strategic Leadership of Healthcare Organizations), HMG 6323 (Healthcare Informatics in Healthcare), in addition to this course (HMG 6332), and earn a minimum 'B' grade in each course, you qualify for a Yellow Belt in Health Care Lean Six Sigma. You need to consult Dr. Ramanathan with a transcript highlighting the four courses.

## **Learning Objectives**

1. Understand concepts of Lean and Six Sigma processes as applied to healthcare
2. Develop analytical thinking and problem solving capability  
Cultivate ability to apply concepts and techniques to process engineering in healthcare
3. Be familiar with tools and software in advanced process engineering in healthcare
4. Express your ideas and thoughts clearly and concisely

## **Required Text**

Lean Six Sigma for Healthcare Professionals - by Kannan Ramanathan

This book will be available from:

Off Campus Books, 561 W. Campbell Road, #201, Richardson, TX 75080  
after May 25th

**Please note that a copy of this book will be kept on reserve in the library**

We will also use slides that will be posted on elearning

## **Required Reading**

Factory Efficiency Comes to the Hospital The New York Times, July 9, 2010. by Julie Weed, Seattle	PQ1
In a World of Throwaways, Making a Dent in Medical Waste The New York Times, By Ingfei Chen, July 5, 2010	PQ2
Writing The New Playbook For U.S. Health Care: Lessons From Wisconsin HEALTH AFFAIRS ~ Volume 28, Number 5, September/October 2009	PQ3
The Impact of Six Sigma Improvement-A Glimpse into the Future of Statistics Gerald J. Hahn, William J. Hill, Roger W. Hoerl, Stephen A. ZinkgrafSource: The American Statistician, Vol. 53, No. 3 (Aug., 1999), pp. 208-215. Published by: American Statistical Association. Stable URL: <a href="http://www.jstor.org/stable/2686099">http://www.jstor.org/stable/2686099</a> .	PQ4
The Cost Conundrum: What a Texas town can teach us about health care. by Atul Gawande June 1, 2009 in The New Yorker	PQ5
Bitter Pill: Why Medical Bills Are Killing U: TIME, Monday, Mar. 04, 2013, By Steven Brill	PQ6

## **Recommended Reading**

Lean Hospitals - Improving Quality, Patient Safety, and Employee Satisfaction by Mark Graban  
The Six Sigma Handbook (Third Edition) by Thomas Pyzdek & Paul Keller

**Assignments & Academic Calendar**

	Tue, Jun-02				Course Overview						
		Chapter	1		Three core problems in healthcare						
		Chapter	2		How a quality framework can help						
		Chapter	3		Definition of quality						
		Chapter	4		Quality in healthcare						
	Tue, Jun-09	Chapter	5		Specify Value						
		Chapter	5		Specify Value - Difficulties in estimating value						
		Chapter	5		Specify Value - Estimating costs						
		Chapter	5		Specify Value - Estimating benefits						
		Chapter	6		Identify Value Stream						
		Chapter	6		Identify Value Stream - Waste						
		Chapter	6		Identify Value Stream - Value Stream Mapping						
	Tue, Jun-16	Chapter	7		Make it Flow						
		Chapter	7		Make it Flow - Quality-at-source						
		Chapter	7		Make it Flow - Quality-at-source - Poka Yoke						
		Chapter	7		Make it Flow - Quality-at-source - Jidoka						
		Chapter	7		Make it Flow - Quality-at-source - CRM						
		Chapter	7		Make it Flow - Quality-at-source - Poka Yoke - Video						
	Tue, Jun-23	Chapter	7		Make it Flow - Layout planning - Background						
		Chapter	7		Make it Flow - Types of layouts						
		Chapter	8		Pull - Takt Time						
		Chapter	8		Pull - JIT - Elements of JIT						
		Chapter	8		Pull - Kanban						
		Chapter	8		Pull - Kanban - Video						
		Chapter	9		Always improving						
		Chapter	9		Always improving - PDCA						

			<b>Mid-Term</b>						
	Tue, Jun-30		<b>Testing Center - 6:00 pm to 9:00 pm (mid-term will be for 90 minutes)</b>						
	Tue, Jul-07		<b>Review of Mid-Term</b>						
			<b>This review is your only opportunity to discuss questions relating to the Mid-Term. I will not discuss the Mid-Term later or during office hours.</b>						
		Chapter	10		Introduction to Six Sigma				
		Chapter	10		Differences between Lean and Six Sigma				
		Chapter	10		Introduction to Six Sigma - Video				
		Chapter	10		Introduction to DEFINE - Issue Statement				
		Chapter	10		DEFINE - VOC				
		Chapter	10		DEFINE - Why listen to VOC				
		Chapter	10		DEFINE - How to listen to VOC				
		Chapter	10		DEFINE - CTQ				
	Tue, Jul-14	Chapter	10		DEFINE - Defects				
		Chapter	10		DEFINE - QFD				
		Chapter	10		DEFINE - Project Scope				
		Chapter	10		DEFINE - Prioritizing CTQs				
		Chapter	10		DEFINE - COPIS				
		Chapter	10		DEFINE - Project Team				
		Chapter	10		DEFINE - Project Charter				
		Chapter	11		MEASURE - Introduction				
		Chapter	11		MEASURE - Fishbone				
		Chapter	11		MEASURE - FMEA, HFMEA				

	Tue, Jul-21	Chapter	11		MEASURE - Root Cause Analysis, Five Whys		
		Chapter	11		MEASURE - Structure, Process, Outcome		
		Chapter	11		MEASURE - AHRQ Quality Indicators - PQI, IQI, PSI, PDI		
		Chapter	11		MEASURE - Approaches to measurement		
		Chapter	11		MEASURE - Standards, Benchmarks, Guidelines		
		Chapter	11		MEASURE - Characteristics of good measures		
		Chapter	11		MEASURE - Validity		
		Chapter	11		MEASURE - Data Collection Plan		
		Chapter	11		MEASURE - Data Collection Plan - Operational definition		
		Chapter	11		MEASURE - Types of data		
		Chapter	11		MEASURE - Sources of data		
		Chapter	11		MEASURE - Sources of variation		
		Chapter	11		MEASURE - Sampling - Probability sampling		
		Chapter	11		MEASURE - Sampling - How much data to collect		
		Chapter	11		MEASURE - Common problems with data		
		Chapter	11		MEASURE - Statistical Process Control		
	Tue, Jul-28	Chapter	12		ANALYZE - Descriptive and Inferential statistics		
		Chapter	12		ANALYZE - Graphical approaches to analyzing data		
		Chapter	12		ANALYZE - Statistical approaches to analyzing data		
		Chapter	12		ANALYZE - Normal distribution		
		Chapter	12		ANALYZE - Hypothesis testing		
		Chapter	12		ANALYZE - Pareto Chart		
		Chapter	12		ANALYZE - Cause-Effect Matrix		
		Chapter	12		ANALYZE - Correlation Coefficient		
	Tue, Aug-04	Chapter	13		IMPROVE - Brainstorming, Simulation, DOE		
		Chapter	13		IMPROVE - Selecting solutions		
		Chapter	13		IMPROVE - Prioritizing solutions - Pugh Matrix		
		Chapter	13		IMPROVE - Prioritizing solutions - Cost Benefit Matrix		
		Chapter	13		IMPROVE - Pilot testing		
		Chapter	13		IMPROVE - Action plan - Gantt chart		
		Chapter	13		IMPROVE - Change Management		
		Chapter	14		CONTROL - Acceptance sampling		
		Chapter	14		CONTROL - Control charts		
		Chapter	14		CONTROL - Types of control charts		
		Chapter	14		CONTROL - Runs and patterns in data		
	<b>Fri, Aug-07</b>	<b>Final</b>	<b>Testing Center - 6:00 pm to 9:00 pm (final will be for 90 minutes)</b>				

**Course Requirements and Grading Policy**

The course content will be presented and discussed through a combination of lectures and class discussions. My intent is to help you think through the issues in a given context, and to help you articulate your participation in class discussions clearly and concisely. Students are expected to attend all classes and to read the assigned material. You need to come to class after having studied the material that will be discussed in a given class. University guidelines recommend that you study 2-3 hours per week for every credit hour in which you are enrolled. Your grade will be based on the following:

Mid-Term	28%	100 Multiple choice questions
Final	28%	100 Multiple choice questions
Pop Quiz I (PQI)	8%	Based on required reading articles.  I will take the best five of the six quizzes.
Pop Quiz II (PQII)	8%	
Pop Quiz III (PQIII)	8%	
Pop Quiz IV (PQIV)	8%	
Pop Quiz V (PQV)	8%	
Pop Quiz VI (PQVI)	8%	
Class Participation	4%	see below . .

**Class Attendance & Participation**

Points for class participation will be based on your punctuality, regular attendance, quality and extent of discussion in class, and during guest lectures. (Note that missing guest lectures will cost you 3% per guest lecture from your final grade). Class participation requires your studying class materials before the class. I will also expect you to maintain professional conduct and decorum inside the class room. **Use of cell phones, laptops, texting, emailing, and surfing the internet are strictly forbidden during class hours. Violation of this rule will cost you 5% off your final grade.**

**Please Note:**

I cannot change the date of your exam - please do not ask

There are no make up quizzes

There is no provision for extra credit

If you miss your exam/test for a valid and documented reason (sick, accident etc.), I will take the average of your grades from other exams/tests for this course

Grades will be based on the following point ranges which may differ from other classes

Range	Letter Grade	Range	Letter Grade
93 - 100	A	80 - 82	B-
90 - 92	A-	75 - 79	C+
86 - 89	B+	70 - 74	C
83 - 85	B	0 - 69	F

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## **Student Conduct and Discipline**

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD publication, A to Z Guide, which is provided to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the Rules and Regulations, Board of Regents, The University of Texas System, Part 1, Chapter VI, Section 3, and in Title V, Rules on Student Services and Activities of the University of Texas Handbook of Operating Procedures. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (S 1.602, 972/883-6391).

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

## **Academic Integrity**

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.

Plagiarism, from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course may use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.

## **Email Use**

The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a U.T. Dallas email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

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### **Withdrawal from Class**

The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose to attend the class once you are enrolled.

### **Student Grievance Procedures**

Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's Handbook of Operating Procedures.

In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations.

If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy to the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the dean will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.

Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

### **Incomplete Grades**

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks of the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of F.

### **Special Assistance**

For help with test anxiety or time management, the following resources are available: your academic advisor, the Learning Resource Center (MC2.402), the Counseling Center (SU1.608), the New Student Programs Office (SU1.608), or your instructor.

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### **Disability Services**

The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of the non-disabled peers. Disability Services is located in room 1.610 in the Student Union.

The contact information for the Office of Disability Services is:

The University of Texas at Dallas, SU 22

PO Box 830688

Richardson, Texas 75083-0688

(972) 883-2098 (voice or TTY)

Essentially, the law requires that colleges and universities make those reasonable adjustments necessary to eliminate discrimination on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind. Occasionally an assignment requirement may be substituted (for example, a research paper versus an oral presentation for a student who is hearing impaired). Classes enrolled students with mobility impairments may have to be rescheduled in accessible facilities. The college or university may need to provide special services such as registration, note-taking, or mobility assistance.

It is the student's responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.

### **Religious Holy Days**

The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.

The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.

If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious day] or if there is similar disagreement about whether the student has been given a reasonable time to complete missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.

### **Off-Campus Instruction and Course Activities**

Off-campus, out-of-state, and foreign instruction and activities are subject to state law and University policies and procedures regarding travel and risk-related activities. Information regarding these rules and regulations may be found at [http://www.utdallas.edu/BusinessAffairs/Travel\\_Risk\\_Activities.htm](http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm). Additional information is available from the office of the school dean.

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