



**Course Title** Lean Six Sigma  
**Course** OPRE 4310-001  
**Call #** 86379  
**Term** Fall 2013  
**Meetings** Wednesday 4pm-6.45pm  
**Classroom** JSOM 2.904  
**Instructor** Kannan Ramanathan

**Instructor's Contact Information**

**Office Phone** (972) 883-5953  
**Office Location** SOM 2.613  
**Email Address** Kannan.Ramanathan@UTDallas.Edu  
**Office Hours** Tue 5:30 - 6:30 PM  
 Wed 2:30 - 3:30 PM  
 And also by appointment

**Teaching Assistant's Contact Information**

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**Office Hours** Tuesdays & Fridays, 3-4pm

**General Course Information**

**Pre- Co- requisites** BA3352

**Course Description**

This class is designed to introduce students to concepts and techniques in Lean and Six Sigma. 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 course covers these topics with an emphasis on quantitative methods.

Employers are increasingly looking for candidates trained in process engineering. As such, this course will benefit students from all business disciplines, and focusing on different majors.

**Learning Goals**

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

**Assignments & Academic Calendar**

The following is a tentative schedule, which I will try to follow as closely as possible. Should any changes become necessary, I will announce it in class.

1	Aug-28	01 Lean & Six Sigma - Introduction.pptx 02 Lean - Evolution & Steps.pptx Introduction to Lean Manufacturing (video)
2	Sep-04	03 Lean - Specify Value - Quality at Source.pptx 04 Lean - Specify Value - 5S Concepts.pptx 05 Lean - Specify Value - 5S Implementation.pptx
3	Sep-11	5S Factory Makeover (video) 06 Lean - Identify Value Stream - Process Mapping.pptx 07 Lean - Identify Value Stream - Why is Inventory bad.pptx
4	Sep-18	08 Lean - Identify Value Stream - Process Layouts - Part A.pptx 08 Lean - Identify Value Stream - Process Layouts - Part B.pptx 09 Lean - Identify Value Stream - Types of Processes.pptx
5	Sep-25	10 Lean - Make It Flow - Setup Time Reduction.pptx 11 Lean - Make It Flow - Heijunka.pptx 12 Lean - Make It Flow - Total Productive Maintenance.pptx
6	Oct-02	13 Lean - Pull - Visual Controls.pptx 14 Lean - Pull - Push & Pull Systems.pptx 15 Lean - Pull - JIT.pptx 16 Lean - Always Improving.pptx
7	Oct-09	<b>Quiz I - Testing Center - McDermott Library</b> <b>You will need your Comet Card</b>
8	Oct-16	Quiz I Review
<b><u>This review is your only opportunity to go over your answers and to discuss questions relating to the MidTerm. Do not miss this review as I will not discuss the MidTerm later or during office hours.</u></b>		
		17 Statistics - Data & Descriptive Statistics.pptx
9	Oct-23	18 Statistics - Distributions, Process Variations & Sigma.pptx
10	Oct-30	<b>Quiz II - Testing Center - McDermott Library</b> <b>You will need your Comet Card. A calculator will be provided</b>
11	Nov-06	19 Six Sigma - Overview.pptx 20 Six Sigma - Define - VOC & CTQs.pptx 21 Six Sigma - Define - Project Selection & Charter.pptx
12	Nov-13	22 Six Sigma - Measure - Overview and Defects.pptx 22A Six Sigma - Measure - QFD.pptx 23 Six Sigma - Measure - Data Collection Plan and Gage R&R.pptx
13	Nov-20	25 Six Sigma - Analyze - Root Cause Analysis.pptx <b>Case Study Paper or Process Map Project Report is due today</b>
14	Nov-27	Fall/Thanksgiving break
15	Dec-04	26 Six Sigma - Analyze - Hypothesis Testing.pptx
16	Dec-11	27 Six Sigma - Improve.pptx 28 Six Sigma - Control.pptx
<b><u>QUIZ III - DATE TO BE DETERMINED</u></b>		

#### Required Reading

1. My class notes (mainly PowerPoint) that will be posted on eLearning

2. Case study from Darden Business Publishing  
Lean Wausau Equipment Company (A) #UV1079  
The case can be purchased online - search for the title on the internet.

### **Recommended Reading**

I recommend you read the following two publications to expand your knowledge and understanding of Lean and Six Sigma.

Becoming Lean - Inside Stories of U.S. Manufacturers  
Jeffrey K. Liker, Editor  
Productivity Press, Portland, Oregon  
ISBN 1-56327-173-7

The Six Sigma Handbook, Third Edition  
Thomas Pyzdek & Paul Keller  
McGrawHill  
ISBN 978-0-07-162338-4

### **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:

Quiz I	31%	
Quiz II	20%	
Quiz III	31%	
Class Participation	6%	See below . .
Case Study Paper	12%	OR
Process Mapping Project		

#### **Case Study Paper**

Read the Case Study "Lean Wausau Equipment Company (A)", and answer the following two questions.

- (a) Comment, with specifics, on whether Lean implementation at Wausau has been successful.  
(b) What should the management's next steps be in the implementation of Lean?

The two questions have to be answered separately. You have two pages (in total, for your answers to both questions). Use single-line spacing, Arial font, font size 11. You can attach any footnotes and references on a third page. Your evaluation on this paper will be based on how clear and professional you are in presenting your analysis and comments. (Professional presentation includes: no spelling errors, no grammar errors, ideas presented logically, ideas supported by arguments and data from the case). Make sure your sheets are stapled. Do not submit a cover page.

Your paper should be submitted both in a hard copy (in class) and in MS Word format on elearning. Put your first name, last name and course as your file name. e.g., student John Doe's paper will be John\_Doe\_OPRE4310.docx. **Due date for this assignment is November 20th 2013 by 4pm**

### **Process Mapping Project**

This is similar to a consulting project. Teams of two students each will work on developing a map of a real process at our university. This will require meetings with our client (some department in the university) and developing a map of the process that the department is engaged in. As an example, one past project involved the process by which the Parking Department distributes parking permits. There are a limited number of projects.

### **Class Participation**

Points for class participation will be based on your punctuality, regular attendance, quality and extent of discussion in class, and during guest lectures. Class participation requires your studying class materials before the class. I may test this with one or more surprise quizzes. Exclusive of the participation grade, you are allowed two excused absences. After that, each absence results in a reduction of 2 percentage points from your total grade. **USE OF LAPTOPS, CELL PHONES, TEXTING, EMAILING, AND SURFING THE INTERNET ARE STRICTLY FORBIDDEN DURING CLASS HOURS - A VIOLATION CARRIES A PENALTY OF 5% FROM YOUR FINAL GRADE.**

### **Please Note:**

Grades will NOT be curved.  
There are no make up quizzes.  
There is no provision for extra credit.  
Grades will be based on the following point ranges:

Point Range	Letter Grade
93 - 100	A
88 - 92	A-
83 - 87	B+
78 - 82	B

Point Range	Letter Grade
73 - 77	B-
68 - 72	C+
63 - 67	C
0 - 62	F

### **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.

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 of the Board of Regents of the University of Texas System, Part 1, Chapter VI, Section 3, and in Title V, Rules on Student Services and Activities of the Course Syllabus Page 8, University's 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 (SSB 4.400, 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 and administration of the School of Management expect from our 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. We want to establish a reputation for the honorable behavior of our graduates, which extends throughout their careers. Both your individual reputation and the school's reputation matter to your success.

The Judicial Affairs website lists examples of academic dishonesty. Dishonesty includes, but is not limited to cheating, plagiarism, collusion, facilitating academic dishonesty, fabrication, failure to contribute to a collaborative project and sabotage. See <http://www.utdallas.edu/judicialaffairs/UTDJudicialAffairs-Basicexamples.html> for details.

Plagiarism on written assignments, especially from the web, from portions of papers for other classes, and from any other source is unacceptable. On written assignments, this course may use the resources of turnitin.com, which searches the web for plagiarized content and is over 90% effective.

During tests and quizzes, students in this section are not allowed to have with them any food or drinks, scratch paper, course materials, textbooks, notes, invisible ink pens, or electronic devices, including IPads, iPhones, iPods, MP3 Players, earphones, radios, smart phones, cameras, calculators, multi-function timepieces, or computers. When possible, students should sit in alternating seats, face forward at all times, and remove any clothing which might conceal eye movements, reflect images of another's work, or hide course material for copying. Exam proctors will monitor any communication or signaling between students by talking, whispering, or making sounds, or by using your hands, feet, other body movements, the test paper itself or your writing implement.

Students in this course suspected of academic dishonesty are subject to disciplinary proceedings, and if found responsible, the following minimum sanctions will be applied:

1. Homework – Zero for the Assignment
2. Case Write-ups – Zero for the Assignment
3. Quizzes – Zero for the Quiz
4. Presentations – Zero for the Assignment
5. Group Work – Zero for the Assignment for all group members
6. Tests – F for the course

These sanctions will be administered only after a student has been found officially responsible for academic dishonesty, either through waiving their right for a disciplinary hearing, or being declared responsible after a hearing administered by Judicial Affairs and the Dean of Student's Office.

In the event that the student receives a failing grade for the course for academic dishonesty, the student is not allowed to withdraw as a way of preventing the grade from being entered on their record. Where a student receives an F in a course and chooses to take the course over to improve their grade, the original grade of F remains on their transcript, but does not count towards calculation of their GPA.

The School of Management also reserves the right to review a student's disciplinary record, on file with the Dean of Students, as one of the criteria for determining a student's eligibility for a scholarship.

### **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 only 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 free 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.

### **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 not 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 of 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 and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from 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 (SU1.610), your instructor.

### **Disability Services**

The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their 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 holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any 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.