UTD Lean Six Sigma	**Course Title**	Lean Six Sigma (Quality Control)
	Course	OPRE 6364
	Term	Spring 2017
	Schedule	Saturdays, 9:00-11:45 am
	Classroom	JSOM 2.802
	Instructor	Rob Shaum, Lean Six Sigma Master Black Belt
	Contact Information	
	Email	ras150630@utdallas.edu
	Phone	(480) 823-4455
	Office/Hours	Appointment only, no office on campus

General Course Information

Pre-Requisites: This course is open to all UTD graduate students regardless of major although those with an undergraduate degree in Business, Engineering or other analytical discipline may feel more comfortable with the content. Undergraduates interested in this topic should consider taking OPRE 4310 but may be allowed in this course with prior instructor approval.

Course Description: Employers in all industries seek candidates with the analytical skills necessary to continuously improve bottom line results. This course is designed to introduce students to key concepts and techniques used in Lean and Six Sigma, two well-known methodologies with proven business impact. Application to a wide variety of industries and functions will be examined throughout the course.

Learning Objectives: At the conclusion of this course, the student should be able to

1. Identify and define key terms associated with Quality Control.
2. Describe the history, purpose, framework and basic techniques associated with both Lean and Six Sigma methodologies.
3. Articulate the relative strengths of each method with the ability to define when one is preferable to the other or when a synergy of the two is best applied.
4. Apply basic structured problem solving techniques including problem articulation, root cause analysis, creative idea generation and solution validation.
5. Discuss actual or potential application of Lean and Six Sigma in various settings.
6. Identify additional best practice methodologies that complement Lean Six Sigma.

This is not a certification course!

Completion of this course does not result in a professional certification such as a Six Sigma Green Belt. Students seeking these worthwhile certifications should refer to the sources below:

- UTD Lean Six Sigma Green Belt Certificate Program - link
- Society of Manufacturing Engineers Lean Certification - link
- American Society of Quality Six Sigma Certification - link

Inclement Weather Policy: Classroom session cancellation due to inclement weather will be governed in accordance with the UTD Inclement Weather Policy as communicated through all official UTD channels. Students should not contact instructor directly to recommend cancellation, inquire about cancellation or verify cancellation. The UTD policy and communication systems on this topic are the Plan of Record. The University of Texas at Dallas is open for normal business operations and instructional activities unless indicated otherwise on the University's home page. More information on policies and procedures can be found at http://www.utdallas.edu/news/2016/11/17-32294_Inclement-Weather-Emergency-Closing-Procedures-at-_story-wide.html.

Course Requirements and Grading Policy

Course content is delivered primarily through traditional lectures supplemented with required reading assignments. However, students can customize their experience to some extent by selecting learning activities that are suited to their learning style. Each activity includes an opportunity to accumulate a given set of points which will be totaled for the course grade.

Grade	Points Required
A	950-1100
A-	900-949
B+	870-899
B	830-869
B-	800-829
C+	770-799
C	730-769
Fail	0 - 729

Category	Max Points
Content Quizzes	300
Exam 1: Lean	200
Exam 2: Six Sigma	200
Application Exercises	100
Case Study Reflections	100
Class Attendance	140
Online Discussion Posts	60
Total Opportunity	1100

Weekly Content Quizzes: Quizzes will be made available in eLearning immediately after lecture sessions each week and must be completed prior to the following session. Questions will typically be multiple choice, true/false, or matching. Students are allowed to use the provided course materials, reading assignments, or notes taken during class. Use of internet search and collaboration with other students is **highly discouraged** as this will diminish your learning. Each quiz may be attempted twice.

Exams: Two exams will be administered by the Testing Specialists in the Student Success Center. Students must complete the exams within the defined testing time windows. The format is open book (printed course materials, readings and notes). In accordance with test center policy, students may not bring any electronic devices (other than a calculator) but should have access to the course materials via eLearning. Students are reminded that the Testing Center does not allow for walk-ins; please visit http://www.utdallas.edu/studentsuccess/testingcenter/index.html in order to reserve a seat.

(Homework) Application Exercises: These exercises offer the student an opportunity to apply course concepts to simple but practical situations. Application exercises may be completed in collaborative teams of 2-4 students. However, each student must turn in an individual copy with all team members listed. There are a total of 8 application exercises that students can choose but only 4 may be submitted (2 from Lean and 2 from Six Sigma) for a maximum of 25 points each (100 points total).

(Homework) Case Study Reflection: Case studies offer the student an opportunity to examine application of the concepts in practical business situations. It is highly recommended that students complete case studies in collaborative teams of 2-4 students. However, each student must submit an individual copy with all team members listed. There are a total of 8 case studies that students can choose from but only 4 may be submitted (2 from Lean, 2 from Six Sigma) for a maximum of 25 points each (100 points total).

Interactive Participation (Attendance & Discussion): Students can earn a maximum of 200 interactive participation points by attending class (10 points per week) and/or by engaging in online discussions (5 points per week) covering lecture content, test prep, guest speaker reviews or any other course content related discussion. These points will be self-reported by students via online monthly activity reports.

Extra Credit: There are no extra credit assignments. Ample opportunity for success has been accounted for in the design of the point based system.

Course Schedule

Following is a tentative schedule which I will do my best to follow. Any necessary changes will be announced in class and/or eLearning and/or email distribution.

Week	***Date***	***Classroom Topic(s)***	***Pre-Reading Assignment***	***Assignment Due***
1	1/14	Administrative Overview Introduction to Lean Six Sigma	Course Syllabus	N/A
2	1/21	Origins of Lean Lean Models	Decoding the DNA of Toyota	Online Quiz Week 1
3	1/28	Lean: Identify Value Lean: Map the Value Stream	Value Stream Mapping (ASQ)	Online Quiz Week 2
4	2/4	Lean: Create Flow Lean: Establish Pull	Hirano's 8 Conditions for Flow	Online Quiz Week 3 Activity Report (Jan)
5	2/11	Lean: Seek Perfection, Part 1	Lean Case 1 (self-select)	Online Quiz Week 4
6	2/18	Lean: Seek Perfection, Part 2 Exam 1 Preparation	Lean Case 2 (self-select)	Online Quiz Week 5 Lean Applications
7	**2/25**	**Exam 1: Lean**	**2/20 to 3/3 during Testing Center hours of operation**	**Online Quiz Week 6**
8	3/4	Quality Basics	Optional Article: link (recommended, not required)	Lean Case Studies Activity Report (Feb)
9	3/11	Statistics for Six Sigma	Cartoon Guide to Statistics (recommended, not required)	Online Quiz Week 8
	3/18	Spring Break	N/A	N/A
10	3/25	Six Sigma Overview	Six Sigma Handbook Ch 1 (recommended, not required)	Online Quiz Week 9
11	4/1	Six Sigma Define	Six Sigma Case 1 (self-select)	Online Quiz Week 10 Activity Report (Mar)
12	4/8	Six Sigma Measure	Six Sigma Case 2 (self-select)	Online Quiz Week 11
13	4/15	Six Sigma Analyze	Optional Article: link (recommended, not required)	Online Quiz Week 12
14	4/22	Six Sigma Improve, Control Exam 2 Preparation	7 Attributes of a Control Plan	Six Sigma Applications Online Quiz Week 13
15	4/29	Beyond Lean Six Sigma	Peruse www.tocinstitute.org (recommended, not required)	Six Sigma Case Studies Online Quiz Week 14
16	**5/6**	**Exam 2: Six Sigma**	**4/24 to 5/6 during Testing Center hours of operation**	**Activity Report (Apr)** **Online Quiz Week 15**

Required Reading (will be referenced in lectures, assignments, quizzes and/or exams)
As a convenience, I attempted to identify publicly available materials. However, all referenced publications are the property of the authors and their respective publishers. Any access restrictions imposed by said owners are a matter between the student and the publisher, outside the purview of UTD or its instructors.

- Article 1: "Decoding the DNA of the Toyota Production System"
  - Spear & Bowen, Harvard Business Review
  - https://hbr.org/1999/09/decoding-the-dna-of-the-toyota-production-system
- Article 2: "Value Stream Mapping"
  - Uncredited Author, ASQ Toronto Posting
  - http://asqtorontoforum.org/asqtoronto/wp-content/uploads/2013/10/Value-Stream-Mapping2.pdf
- Article 3: "Hirano's Eight Conditions for Flow"
  - Richard Kunst, Lean Thoughts, August 2009
  - http://kunstartofsolutions.com/LeanThoughts/Vol_8_Issue_34_Lean_Thoughts_August_24_2009.pdf
- Article 4: "Seven Attributes of a Control Plan"
  - Forrest Breyfogle III, Quality Magazine Blog
  - http://www.qualitymag.com/blogs/14-quality-blog/post/92190-seven-attributes-of-a-control-plan-for-lean-six-sigma-and-the-business

Case Studies
As described above, students may choose up to 4 case studies, 2 from Lean and 2 from Six Sigma to provide written feedback on. The case study template is available on eLearning. Students are encouraged to work on case studies in teams of 2-4 but each student must submit a copy with all team members listed.

- Lean Case Studies
  - Thrustmaster, http://www.lean.org/common/display/?o=3342
  - LSG Sky Chefs, http://www.lean.org/common/display/?o=786
  - City of Calgary, http://www.lean.org/common/display/?o=796
  - Menlow, http://www.lean.org/common/display/?o=813
- Six Sigma Case Studies
  - Cummins, http://rube.asq.org/2006/09/six-sigma/six-sigma-saves-nearly-1-billion.pdf
  - Retail Bank, http://rube.asq.org/2008/09/six-sigma/simplify-and-unleash-one-banks-strategy-for-growth.pdf
  - Firstsource Financial, http://rube.asq.org/2011/04/six-sigma/service-provider-improves-clients-metrics.pdf
  - Pocono Medical Center, http://rube.asq.org/2006/10/six-sigma/pocono-medical-center-faster-lab-results.pdf

Recommended Reading

For additional insights above and beyond the scope of this course, I recommend the following:

The Improvement Guide: A Practical Approach to Enhancing Organizational Performance
Gerald Langely, et al
Jossey Bass
ISBN: 978-0470192412

Lean Thinking: Banish Waste and Create Wealth in your Corporation
James P. Womack, Daniel T. Jones
Simon & Shuster
ISBN: 978- 0743249270

Learning to See: Value Stream Mapping to Create Value and Eliminate MUDA
Mike Rother
Lean Enterprise Institute
ISBN: 978-0966784305

The Hitchhiker's Guide to Lean
Jamie Flinchbaugh, Andy Carlino
Society of Manufacturing Engineers
ISBN: 978-0872638310

Six Sigma Handbook, Fourth Edition
Thomas Pyzdek, Paul Keller
McGraw Hill
ISBN: 978-0071840538

The Cartoon Guide to Statistics
Larry Gonick, Woollcott Smith
Harper Perennial
ISBN: 978-0062731029

Even You Can Learn Statistics
David Levine, David Stephan
FT Press
ISBN: 978-0137010591

The Goal: A Process of Ongoing Improvement
Eliyahu Goldratt
North River Press
ISBN: 978-0884271951