

Fall 2017
EMGT 5331: Six Sigma Quality

This syllabus covers both face-to-face (EMGT 5331-01) and online (EMGT 5331-02/3) sessions

UPDATE

Due to Hurricane Harvey, the due day of the first assignment has been postponed to 9/11. The first face-to-face class was cancelled and all learning materials (including voice-record powerpoint files) are available to enrolled students on the blackboard.

IMPORTANT COURSE POLICIES

- A week starts from Thursday and ends on Wednesday. Hence, all weekly assignments are due by Wednesday unless there are other announcements.
- All emails should copy the teaching assistant (TA) for a prompt response.
- I and TA are trying to be responsive to your email. TA should be dedicated to this class only for 20 hours per week. You should expect to receive a response from TA first and I may send an extra response to complement his/her response if needed.
- I am doing my best to be responsive. However, it is reasonable not to expect to receive a response from me during weekends. You should contact TA during weekends but still copy me.
- Read the no late assignment acceptance policy carefully
- Read the quiz policy carefully

Course Description

Six Sigma is a statistics-based, process-focused, data-oriented methodology to improve processes and reduce process variability. With the aim of reducing product or service defect rates to roughly 3.4 defects per million opportunities, Six Sigma project success stories exist for many organizations including manufacturing, service, government, and healthcare. This course covers the DMAIC (Define, Measure, Analyze, Improve, and Control) phases of Six Sigma with emphasis on statistics and MINITAB software. By the end of this semester, students will have the equivalent knowledge of Six Sigma Greenbelt or more.

Prerequisite: Foundation courses (3 CR)

Course Learning Outcomes

Upon completion of this course, students will be able to:

- recognize key attributes of a successful Six Sigma program or project
- understand fundamentals of DMAIC methodology
- apply Six Sigma problem-solving techniques to real world problems
- apply diverse statistical knowledge and techniques such as Design of Experiment and hypothesis inference to solve quality problems
- use of MINITAB statistical software package within the context of Six Sigma

Class Information

| Section | Time | Classroom |
|-----------------------------|-------------------------------|-------------------|
| EMGT 5331-01 (face-to-face) | 7:00 PM – 9:50 PM on Thursday | Room 203 in Delta |

Required Teaching Materials

Textbook

Summers, D., *Six Sigma: Basic Tools and Techniques*, Pearson Prentice Hall: Upper SaddleRiver, NJ, 2007. ISBN 0-13-171680-8

Minitab

- Minitab is a statistical analysis software package used by many quality engineers and professionals. It is one of the leading packages used in Six Sigma projects, and it is known for its comprehensive collection of methods and unsurpassed ease-of-use. Minitab will be heavily used throughout this Six Sigma course.
- UHCL has an enterprise site license, and it is available at all computer labs. The computer support office works 8 to 5 PM Monday to Thursday – and install it on your computer.
- You may download a trial version of Minitab at <http://www.minitab.com/en-us/products/minitab/>. However, please be aware that you can use this trial version only for **30 days**. It may take time to obtain a license verification code. Hence schedule the download and installation in advance.

Instructor Information

| | |
|--------------|---|
| Professor | <i>Xiaojun (Gene) Shan</i> , Ph.D. |
| Bio | Dr. Shan received his PhD in Industrial and Systems Engineering from University at Buffalo, State University of New York and has published more than 10 papers in top journals. His research interests include healthcare delivery systems, energy systems, and risk management against natural and man-made disasters. |
| Office | Room 6 at Delta Annex Building, 2700 Bay Area Blvd, Houston, TX 77058 |
| Contact | 281-283-3814; shan@uhcl.edu |
| Office hours | 2:00 PM – 4:00 PM on Tuesday/Thursday; Others by appointment |
| Others | Email is the preferred method of communication – I am trying to be very responsive. If you leave a telephone message, please be sure to leave your name, the class name and section number, a return phone number and appropriate times for return phone calls. |

Student Responsibilities

Time Commitment

This is a 3-credit course for 15 weeks, equivalent 45 semester hours. In order to meet accreditation standards, on average, students should expect to spend between 15 to 20 hours per week on course activities and assignments. Spending less time would be insufficient for success in this course.

Academic Honesty

The University of Houston Clear Lake has a “0” tolerance policy for academic dishonesty and if the student is in violation an “F” the course will be apply. Please refer to the UHCL academic honesty policy.

Dropping Course

Students may drop a course through the registration process and may receive a refund during the first week of classes. After the first week students need to notify the instructor and then withdraw from the course as faculty will not drop or withdraw a course for students. Please refer to the academic calendar for the exact dates and also review the withdrawal policy <https://www.uhcl.edu/academics/resources/academic-calendar/>

Counseling Services

Counseling assistance will be available on Tuesday and Thursdays by appointment

Technical Assistance

Help Desk Hours -

Monday through Thursday 8 A.M. to 10:30 P.M.

Friday 8 A.M. to 5 P.M.

Saturday 8 A.M. to 5 P.M.

Sunday Closed

Email: supportcenter@uhcl.edu

Phone: (281) 283-2828

From Student and Educational Services-Students with Disabilities

If you wish to receive special accommodations as a student with a documented disability, please make an appointment with the [Disability Services](#) at ext. 2626 or Students service building Room 1301

Course Progress

Considering the diverse course format and intensity, it is strongly recommended that you complete all required readings prior to the class.

Late Assignment and Make-up Exam Policy

There is no make-up exam allowed.

Late submission not accepted – no exception.

Further, requesting replacement of any submitted assignment will not be accepted (In the past, we received too many claims that they had submitted wrong files, etc.)

Grading Policy

Grading Scale and guidelines

Your grade will be determined by the following four components:

- a. Exam 1 (Define, Measure; 10%)
- b. Exam 2 (Analyze, Improve; 10%)
- c. Exam 3 (Control; 10%)

- d. Team project (30%)
- e. Homework (30 %)
- f. Class participation & team member evaluation (10%)

Scale

| | | | | |
|-----|-----------|----|-----------------|-----------|
| A | 93-100% | A- | 88-92.99% | |
| B+ | 86-87.99% | B | 83-85.99% B- | 80-82.99% |
| C+ | 77-79.99% | C | 73-76.99% C- | 70-72.99% |
| F < | 70% | | | |

Exams/Project

Exam

- a. Each exam covers separate modules of the Six Sigma DMAIC process
- b. Exam contains multiple choice questions, and will be administrated on Blackboard
- c. Exams are open book/open notes. However, all works should be done individually. Hence any discussion with your peers is prohibited, and considered as an academic dishonesty.

Projects

- a. A team of three to four people is formed, and each team is required to submit a mini-Six Sigma case study where the team identifies any process improvement problem and applies the Six Sigma methodologies (DMAIC) to solve it.
- b. This team project will be self-directed, which means that each team must decide on the nature of the project on its own. You might choose an actual project at your work or you may create your own imaginary project. In either case, it is necessary to create your own data since it is practically difficult to collect all data for confidentiality reasons. You must
- c. The purpose of this fictitious project is to build your capability to apply the DMAIC approaches to your choice of problems. Therefore, you should specifically apply most of the tools learned in each step of the DMAIC to the problem. “The Paper Organizers International: a fictitious SixSigma Greenbelt project” or “Tutorial for IT Call Center Project” posted in Week 5 module) can be used as your template. In general you must:
 - Show clear measurable objectives;
 - Show a solid project implementation procedure;
 - You must generate all numerical data using MINITAB/EXCEL; Otherwise, I will try to give you a low grade since you should demonstrate your data-oriented skills with this project.
 - Show data analysis to demonstrate your performance characteristics before Six Sigma and after Six Sigma using MINITAB
 - Follow DMAIC process based on data;
 - Your fictitious project should very clearly and specifically describe the processes to identify your inputs/outputs for CTQs. Simply describing the CTQ before and after six sigma without generating significant data will lead to failure and/or unsatisfactory grade on your project.

- Your project should include **at least five of the following statistical or Six Sigma specific methods**
 - SIPOC/Failure Mode & Effect Analysis/Six Sigma specific charts
 - Basic data analysis tool (e.g., descriptive analysis, correlation analysis, Pareto chart, histogram etc.)
 - Hypothesis tests
 - Process Capability and its associate
 - Regression
 - Gage R&R
 - ANOVA or MANOVA
 - Design of Experiments
 - Control charts
 - Other statistical tools

- d. Your team needs to submit the final team project report.
 - The final team project will have ***no more than 30 pages*** (1.5 spaced with 12 pts) plus Minitab outputs in the Appendix.
 - The ***15 minutes final team presentation*** will be required.
 - The grading policy: Report 70% and Presentation 30%
 - PPT will be evaluated based on
 - ✓ Professional presentation
 - ✓ Logical organization
 - ✓ Time duration (less than 25 minutes)
 - ✓ Format etc
 - Report will be evaluated based on
 - ✓ Conformance to DMAIC phase
 - ✓ Statistical & Analytical
 - ✓ Logical soundness
 - ✓ Organization
 - ✓ Format & proof reading & references (APA format)