

IT 303 – Lean Six Sigma Green Belt Class

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COURSE DESCRIPTION

4 units

Prerequisite: STAT 217, STAT 218, STAT 251, or any 300 or 400 level statistics course.
Development of a comprehensive set of skills to effectively function as a lean six sigma leader.
Discussion and problem workout sessions covering the lean six sigma green belt body of knowledge including problem definition, measurement, analysis, improvement, and control, as well as the team leadership skills necessary to complete projects. 4 lectures.

LEARNING GOALS AND OUTCOMES

The overarching learning objective of this course is to develop a comprehensive set of skills that will allow you to function effectively as a Lean Six Sigma leader. The Green Belt body of knowledge includes techniques for both quantitative and non-quantitative analysis, as well as the team leadership skills necessary to get projects across the goal line. This course is about training, NOT certification.

After completing this course, you should be able to DO the following:

1. Communicate using Lean Six Sigma concepts.
2. Think about your organization as a collection of processes, with inputs that determine the output.
3. Relate Lean Six Sigma concepts to the overall business mission and objectives.
4. Use the concept of a Sigma Level to evaluate the capability of a process or organization.
5. Understand and apply the five step D-M-A-I-C model as a framework to organize process improvement activity.
6. Employ a wide range of process improvement techniques within the D-M-A-I-C model.
7. Recognize the organizational factors that are necessary groundwork for a successful Lean Six Sigma effort.
8. Employ your Six Sigma skills to lead a successful process improvement project delivering meaningful results to the organization.

Testimonial from past Student: "In addition, I want to thank you for what has turned out to be an excellent class. Since learning the principles of lean six sigma and applying them to my project I have begun to view mundane everyday tasks as a process/system, which, with the use of the appropriate tools, may become increasingly more efficient and effective in achieving their intended goal. Moreover, the means by which you taught us these principles - e.g. the flipped classroom experience - really helped me to understand how what I was learning in the modules applied to the jobs of those people who came into speak. Although this autonomous system of learning did initially backfire on me as I struggled to keep up with MoreSteam's demanding study schedule, it did, in the end, prove to be the most effective

way for me to learn the material, which I hope is evident from my score on the final.

In short, thank you for offering this class and for doing so in a fun and interactive way. I am graduating this coming Saturday (assuming I pass all my finals ha ha), however, I hope to stay in touch. Who knows, maybe someday I will go on to do great things with the knowledge I took from your class and can come in to share that with your new crop of students."

- David Berning, Pilot Class Fall 2003

Related – IT Program Learning Goals

LG1: Demonstrate general knowledge within their area of interest in Industrial Technology.

LG4: Act upon decision tools and methods and explain the action taken.

LG5: Explain the important elements of team success.

COURSE MATERIALS

- A. This course does not have a text. We will be using the same online training material used by over 45% of Fortune 500 Companies. MoreSteam is a premiere supplier of online lean six sigma training material <https://www.moresteam.com/elearning/tour/lean-six-sigma-retail-tour.cfm>? You need to purchase access for a year at <https://www.moresteam.com/university/calpoly.cfm> Select Cal Poly Lean Six Sigma Green Belt and Exam Standard 80 Hours \$300. Note that this is a significant discount from the list price of \$1,900.
- B. You are also required to get a free copy of Minitab from Cal Poly's software download channel. Minitab only runs on a PC (not Mac). Make sure you have access.

COURSE OUTLINE

IT303 Green Belt Belt - Block Plan

Dec13 Rev D

Wk	Online Session: Title	Online Hours	Target Complete*	Week Total
1	Session 1: Introduction to Lean Six Sigma Session 2: Define 1 - Starting a Project and Leading Teams	4.6 5.1	1/12/13	9.7
2	Session 3: Define 2 - Voice of the Customer Session 4: Define 3 - Mapping the Process	6.5 5.3	1/19/13	11.8
3	Session 5: Measure 1 - Measurements and Basic Statistics	5.8	1/26/13	5.8
4	Session 6: Measure 2 - Measurement System Analysis	8.6	2/2/13	8.6
5	Session 7: Measure 3 - Charting Process Behavior Mini-Project Draft Charter due	9.4	2/9/13	9.4
6	Session 8: Analyze 1 - Identifying potential root causes	6.9	2/16/13	6.9
7	Session 9: Analyze 2 - Hypothesis Testing	10.9	2/23/13	10.9
8	Session 10: Improve	11.4	3/2/13	11.4
9	Session 11: Control Final Mini-Project due	6.1	3/9/13	6.1
10	Open Practice Test due		3/16/13	
Online Exam		3.0	Wed, 19Mar, 9am-2pm	3.0
		83.3		83.6

Notes: * Target complete section quiz by Sunday, 11pm.

COURSE REQUIREMENTS

To successfully achieve the learning objectives for this course, you are required to:

1. Complete quiz for each topic per the schedule provided above.
2. Prepare to discuss and ask questions about material covered in online sessions.
3. Attend weekly class sessions designed to enhance your understanding and appreciation of the course material.
4. Complete the Practice Test.
5. Complete a “Lean Six Sigma Mini-Project” (see below).
6. Pass a comprehensive exam during finals week – 60 questions, 3 hrs.

PERFORMANCE EVALUATION

Quizzes	20
Class participation	10
Mini Project	15
Practice Test	5
Comprehensive 3 hr exam	50
Total	100%

Class participation:

1. Quantitative measures – complete and on time (5% total)
 - a) Index card – 3pts
 - b) Resume – 3 pts
 - c) Draft project charter – 6pts
 - d) Movie Quizzes (4 minimum) – 24pts total. Additional movie quizzes will be counted as extra credit.
 - e) On time completion of online session quizzes – 33pts total (3 pts each)
 - f) Random attendance checks for activity (non-movie) meetings (4 max) – 3pts each
2. Qualitative measures (5% total) - Instructor subjective evaluation of attendance and participation.

POLICIES AND PROCEDURES

Personal Integrity Policy

Your most valuable asset is your personal integrity. Exercise and develop this important asset in this course. The penalty for cheating is an **F for the course**. Cheating occurs when:

1. A student looks at other students' work during a quiz or exam or obtains help of faculty or students outside their assigned group on assigned homework sets or exams.
2. A student copies large sections of another author's material without referencing it (plagiarism).
3. Students share answers to online quizzes or individual homework assignments.

In contrast to cheating, I believe it is beneficial to work in pairs and groups to study, discuss, and understand the material. This is especially true in addressing “supplemental exercises” at the end of each section. Feel free to discuss the online content and supplemental exercises with your classmates or others to build your understanding of the material.

You are responsible for anything that is said in class or any changes made to assignments. Do not e-mail or call me asking, “What did I miss?” Find a buddy to share coverage responsibility.

I do not give additional projects to increase one's grade.

Requirements for Lean Six Sigma Mini-Project

Objective and Overview

It is important to exercise your knowledge to own it. This is especially true in the world of lean six sigma. Therefore, one of the requirements of this course is that you apply the concepts and tools that you are learning from the MoreSteam online content to a real project. This is the “learn-by-doing” portion of the course.

You shall select a process to improve and apply the DMAIC steps to that process. In the real world, you would be working with a team and have a great deal of flexibility about which approach and tools you would use to solve a problem. This project is to be completed on your own or possibly with the assistance of people involved in the process that you have selected. To manage and grade the large number of students taking this course, the documentation for the project is standardized. The remainder of this document explains the basic project requirements. Questions will be addressed during the weekly sessions.

Step 1: Select a Process to Improve

I suggest you complete at least the first four online sessions before you select a process. The best process to select involves a real world problem that you have a vested interest in solving. This is especially true of work processes at an internship. Alternatively, you can propose any process that you are familiar with and have access to. **Select a process that has an “outside” sponsor (not you) to work with.** Consider whether the improvement of this process would look good on a resume. Would you be able to use this as an example for how you have applied the DMAIC process in a job interview? Consider whether this process would help others beside you. Ultimately, you need to strike a balance between doing a significant project that may be big and complex, with a project that is simple enough to use as an explanation of the DMAIC process. Once you have decided on a candidate process or two, be sure to review the rest of the project requirements to be sure you have an idea how the project will roll out and which specific tools you might use. **Note that you may have to expand the scope of your project to apply all 10 tools to the problem.** Also note that applying all 10 tools may not necessarily solve the problem you have identified. This is okay. That is why we call it a “mini” project.

Step 2: Draft a Project Charter and Get Instructor Approval

One key tool in the Define stage of a project is the “Project Charter.” You are required to provide the instructor with a **rough draft Project Charter** of your proposed project **by the beginning of the 6th week** of the class. You will not necessarily be able to insert all the required fields in the online form (see MoreSteam) by the fifth week, but you should provide enough information to demonstrate to the instructor that you have a high likelihood of success. Submit your draft Project Chart as directed by the instructor.

Step 3: Create a Project Plan

Review the “Lean 6 Sigma DMAIC Map (SIX SIGMA PROCESS IMPROVEMENT FLOWCHART)” in the sidebar of the MoreSteam training. You are required to apply a minimum of **two tools to each DMAIC stage**. Fortunately, the **Project Charter** counts as one tool in the Define stage. **You are also required to apply at least one “statistical tool” in your project**. Examples of statistical tools include control charts, hypothesis tests, correlation, capability, and regression analysis.

Project Plan Outline

Define

1. Tool – Project Charter
2. Tool – ???

Measure

1. Tool – ???
2. Tool – ???

Analyze

1. Tool – ???
2. Tool – ???

Improve

1. Tool – ???
2. Tool – ???

Control

1. Tool – ???
2. Tool – ???

Aside from executing each tool in your plan, you will also provide a **brief, clear statement on:**

1. **Why you applied that particular tool to your project and**
2. **Your interpretation is of the result** (see “Thought Process Map” Session 1, Lesson 15).

The project you will submit by the last day of the class will consist of a total of 10 tools, 10 “why” statements and 10 corresponding “interpretation” statements.

A good “lean” approach that reduces muda for your instructor is to have every new tool begin on a new page with a title, the DMAIC stage the tool is applied to, your “why”, and “interpretation” statements.

Step 4: Execute your Project

During the execution of the project, bring your observations and questions to the weekly sessions if you choose [For independent study projects you may contact the instructor as needed].

Step 5: Compile your results

Put all your tools and statements into **one** MSword.docx document. Make sure:

1. The tools and statements are all in DMAIC process order.
2. The word file name includes your name.
3. All pages are numbered.
4. Include a footer with the file name and your name.
5. Include an executive summary and recommendation as the first page of your project.

Step 6: Submit your results

Submit your docx as specified by the instructor.

Grading Criteria

The following is a breakdown of the criteria that will be used in assessing your project:

- 10% Executive summary and recommendations included, well executed, extra effort evident.
- 50% All ten tools submitted, well executed, extra effort evident.
- 10% All ten why statements included, well-executed, extra effort evident.
- 10% All ten interpretation statements included, well executed, extra effort evident.
- 10% Project report submitted on time.
- 10% Format and submission directions followed.