MGT 7242  
Six Sigma Principles  
Fall Semester 2015

Instructor: Peg Pennington  
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Office Hours: Monday and Wednesday’s 2:30 – 3:00 and 4:30 – 5:00 Please make appointment for additional office hours.  
Class Time & Location: Monday/Wednesday – 355 Gerlach Hall  
On-Line Training: www.moresteam.com

PREREQUISITES

This course is open to candidates who have completed MBA6232 – Operations Management and MBA6272-Statistics, or appropriate prerequisites from other colleges. Students are expected to be proficient in the use of Minitab or other statistical packages and have access to a Windows-based computer with high-speed internet access.

COURSE DESCRIPTION

This course is designed to familiarize students with the Six Sigma process improvement methodology and to provide them an opportunity to practice using Six Sigma Black Belt tools. A Six Sigma Black Belt is an individual who is skilled in applying basic and advanced process improvement and project management methods in order to complete projects that will result in significant, sustainable improvements within an organization. Originally developed by Motorola to improve quality in their manufacturing processes, Six Sigma has been adopted by companies throughout the world to improve all types of processes.

When applied in business environments, Six Sigma programs have been used to dramatically increase an organization’s ability to improve quality and customer satisfaction while reducing overall costs. Companies such as AlliedSignal and General Electric have used Six Sigma to significantly increase productivity, operating income and cash flow.

In this course, students will gain an understanding of the strategy and deployment of Six Sigma Black Belt methods. The classroom sessions will combine lectures with group discussions, case based simulations, outside speakers and hands-on exercises.

To complement the in class sessions, students will be required to complete online coursework at www.moresteam.com and other assignments during non-classroom hours.
WHO IS A GOOD BLACK BELT CANDIDATE?

The job description for a Black Belt is one that requires application of Six Sigma tools to achieve a process improvement. The desirable qualities of a Black Belt candidate include a mix of technical aptitude, project management, leadership skills and “soft skills” such as coaching. Of these, the leadership skills and the ability to deliver results are typically weighted the highest. In short, the ideal candidate will be a respected “go-getter” with a technical foundation and a team player.

COURSE MATERIALS

Required:
All students will be required to purchase MoreSteam.com’s web-accessed Six Sigma training program. The cost is $400.00. https://fisher.osu.edu/store/item.php?item_id=107
- Six Sigma Black Belt Workbook – Available at Uniprint, approximate cost $12.00
- Minitab 16 – 6 month rental available for $29.99 or 12 month rental for $49.99

Recommended:
- Minitab Quality Trainer – Minitab Quality Trainer will be given free of charge to students enrolled in the Six Sigma course. This material is a supplement to the class and will not be graded.

PERFORMANCE EVALUATION

Grading:

√ Timely completion of MoreSteam.com coursework and quizzes 21%
Sigma Brew Define, Measure, Analyze Tollgates & Storyboard 20%
Gage R&R Assignment 10%
Black Belt Midterm – Define, Measure 20%
Black Belt Exam 25%
Peer Evaluation 4%
**Moresteam Quizzes**
Students will be graded on the successful completion of the Moresteam.com quiz(izes) every Monday (8 AM). This is identified with a DUE: on the course outline syllabus. **No collaboration of any kind is allowed on Moresteam quizzes.**

Moresteam Quiz grading scale:
- 100% completion with 80% correct = 3 points
- 100% completion with 70-79% correct = 1.5 points
- <100% completion = 0 points

**Sigma Brew Tollgates:**
Each team will be expected to turn in a Tollgate presentation for Define and Measure pertaining to the online case SigmaBrew. Presentations will be turned in at the beginning of class. Tollgate presentation templates and grading rubrics will be available on Carmen.

**Examinations:**
Examinations will be multiple choice (much like the quizzes at the end of the sessions) and be based on the content from Moresteam.

**No make-up, late or early exams will be given, except in the case of medical emergency.** Business related absences are not excused. Students should make arrangements now to avoid time conflicts.
Gauge R&R Measurement System Analysis

Conduct a Gage R&R test using sample size 10, 10 trials and 3 appraisers. Test and stop watches will be provided.

Prepare a written report, 3 pages or less, of the form:

Introduction:

Concise statement of the research question. What results do you anticipate or predict?

Methods:

Clearly describe the precise nature of the Gauge R&R test. Detail here is important. Identify variables that were manipulated, held constant, randomized, or ignored.

The nature of the data collection process is to be described in detail. When and under what conditions was the Gauge R&R completed?

Results:

Report the results and include the Average and Range Charts.

Discussion:

Discuss your Gage R&R results. Does the measurement system have adequate resolution? What is the contribution of the gauge to total measurement variation? What is the contribution of the appraisers to the total measurement variation? What is the contribution of the parts to the total measurement variation? What is the acceptability of the measurement system? Discuss and interpret the chart output.

Are the appraisers/operators adequately trained?
Is the current Operational Definition adequate or should it be revised? What is your recommended course of action?

References:

List any references as appropriate to support your report.
**Classroom Performance**
The value of the class discussions is directly related to the amount of quality student participation.

- evidence of careful preparation of the on-line course work
- clarity and conciseness of your comments and recommendations

This class is generally aided by the use of laptop computers. However, your participation is greatly reduced by checking emails and other non-related internet websites during class. **The computer is to be used for data analysis only during class.**

**DISABILITY ACCOMMODATION**

If you need an accommodation based on the impact of a disability, arrange an appointment with me as soon as possible. We need to discuss the course format and explore potential accommodations. I rely on the Office for Disability Services for assistance in verifying need and developing accommodation strategies. You should start the verification process as soon as possible.

**ACADEMIC MISCONDUCT**

Material submitted for course grade credit **must** be your own work. I will report any suspected case to the University Academic Misconduct Committee for investigation. Past cases have typically resulted in a failing grade for the course. Academic misconduct is a serious threat to the integrity and value of the Fisher College diploma. Such behavior is intolerable.

**Final Exam:**
Peer Evaluation

Please include all team members’ names on the front page of the report in alphabetical order. Teams should consist of 3 students.

**Peer Evaluation – Group Projects**

Peer evaluations will count for a maximum of 10% of the total points. Your peer evaluation points will be awarded as follows: the quality and timeliness of your submission and the rating by your peers.

When you are evaluating the efforts of yourself and your peers you should take the following actions into account; quality of effort, quantity of effort, working relationship with group members, and completion of assignments in a timely fashion. **Peer evaluations are due to the instructor by Monday, December 7th.**

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<tr>
<th>Your Name: ________________________________</th>
<th>Team #/Letter _____</th>
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<tr>
<td><strong>Group Members (including yourself):</strong></td>
<td><strong>Weight</strong></td>
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**TOTAL 100%**

**COMMENTS:**

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<th>Minitab Quality Trainer</th>
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| 1. Wed., Aug. 26| • Intro to Lean and Six Sigma  
• Intro to Moresteam  
• Intro to Minitab Quality Trainer | Review - Session 1 – Introduction to Lean Six Sigma                     |                                                                                        |                        |
| 2. Mon., Aug. 31| • Policy Deployment and value based project selection  
• Intro to Sigmabrew  
• Create Sigmabrew Teams  
• DISC Analysis  
• Leading Teams and Change  
• Launching Teams | DUE: Session 1 quiz  
Review Session 2 – Define I – Project Initiation and Leading Teams |                                                                                        |                        |
| 3. Wed., Sept. 2 | • Voice of the Customer  
• Survey’s  
• Market Segmentation  
• CTQC Tree | Review Session 3 – Define II – Voice of the Customer |                                                                                        |                        |
| 4. Wed., Sept. 9 (Fisher Recruiting Fair) | • In Class Activity: Build SigmaBrew SIPOC  
• Review Define Tollgate Expectations | DUE: Session 2 & 3 Quiz  
DUE: SigmaBrew Define Tollgate Review |                                                                                        |                        |
• Build SigmaBrew Project Charter | DUE: Session 4 quiz |                                                                                        |                        |
| 6. Wed., Sept. 16 | • SigmaBrew Define Tollgate Review Presentations (2 teams randomly selected)  
• Descriptive Statistics | Session 5 – Measure I – Measurements and Basic Statistics  
Chapter 1 – Descriptive Statistics and Graphical Analysis | DUE: SigmaBrew Define Tollgate Review |                        |
| 7. Mon., Sept. 21 | • Continue Descriptive Statistics | DUE: Session 5 quiz  
Chapter 2 – Statistical Inference |                                                                                        |                        |
| 8. Wed., Sept. 23 | • Data Collection Plan  
• Measurement System Analysis | Session 6 – Measure II – Measurement System Analysis, 6.1-6.2, 6.10-6.15 |                                                                                        |                        |
| 9. Mon., Sept. 28 | • Variable MSA  
• In Class Activity | Session 6 – remaining section | Chapter 8 – Measurement Systems Analysis |                        |
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| 10. Wed., Sept. 30 | • Attribute Agreement Analysis  
              • Review Measure Tollgate Expectations | DUE: Session 6 quiz               |                         |                                   |
| Thurs., Oct. 1  | Moresteam Lean Six Sigma networking event at The Faculty Club |                                   |                         |                                   |
|              |                                   | DUE: Session 7 quiz               |                         |                                   |
|              | FALL BREAK Wednesday, October 14 |                                   |                         |                                   |
| 14. Mon., Oct. 19 | • Exam Review                   | Define and Measure                | DUE: SigmaBrew Measure Tollgate Review |                                   |
| 15. Wed., Oct. 21 | • Midterm Exam                  | Define and Measure                |                         |                                   |
|              |                                   |                                   |                         |                                   |
| 17. Wed., Oct. 28 | • Root Cause Analysis           |                                   |                         |                                   |
| 18. Mon., Nov. 2  | • Introduction Regression       | Session 9 – Analyze II – Hypothesis Testing | Chapter 7 – Correlations and Regression |                                   |
| 19. Wed., Nov. 4  | • Regression Cont’d            |                                   |                         |                                   |
| Date           | Class Subject                                      | Moresteam               | Minitab Quality Trainer | Other
|----------------|---------------------------------------------------|-------------------------|--------------------------|--------|
| 20. Mon., Nov. 9 | • ANOVA  
• DOE Introduction | DUE: Session 8 quiz  
Session 10 – 1-7  
Analyze III Design of Experiments | Chapter 6 – ANOVA  
Chapter 9 – Design of Experiments |        |
|                |                                                   |                         |                          |        |
| 21. Mon., Nov. 16 | • Full Factor                                     | Session 10 – 8-15  
Analyze III Design of Experiments | Due: Sigma Brew Analyze Tollgate |        |
| 22. Wed., Nov. 18 | • Blocking                                         | DUE: Session 9 quiz     |                          |        |
| 23. Mon., Nov. 23 | • DOE III – In class experiment  
• Review Improve Tollgate | Session 10 – 16-23  
Analyze III Design of Experiments |                          |        |
| 23. Mon., Nov. 23 | Class will finish at 5:00 PM                     |                         |                          |        |
| 24. Mon., Nov. 30 | • 6 Red Hats Improvement  
• FMEA                                               | DUE: Session 10 quiz     |                          |        |
| 25. Wed., Dec. 2  | • Improve                                         | DUE: Session 11 quiz     |                          |        |
| 25. Wed., Dec. 2  | • Little’s Law                                     |                          |                          |        |
| 25. Wed., Dec. 2  | • SigmaBrew Improve Tollgate                      |                          |                          |        |
| 25. Wed., Dec. 2  | • Error Proofing, 5S, Standard Work               |                          |                          |        |
|                |                                                   |                         |                          |        |
|                |                                                   |                         |                          |        |
| Sunday, Dec. 6th 3-5pm – six sigma exam review |                          |                          |                          |        |
| 26. Mon., Dec. 7  | • Control                                          | DUE: Session 12 quiz     |                          |        |
| 26. Mon., Dec. 7  | • Visual Management                                |                          |                          |        |
| 27. Wed., Dec 9   | SigmaBrew Storyboard Presentations,  
Exam Review                                         | DUE: SigmaBrew Storyboard |                          |        |
|                |                                                   |                         |                          |        |
| Final Exam Dec. 10 - 12 |                          | Sessions 1 - 12          |                          |        |
|                |                                                   |                         |                          |        |