MISSISSIPPI STATE UNIVERSITY COLLEGE OF EDUCATION
DEPARTMENT of INSTRUCTIONAL SYSTEMS and WORKFORCE DEVELOPMENT

Course Prefix and Number: INDT 4373
Course Title: Lean Six Sigma
Credit Hours: 3 credit hours
Method of Instruction: Lecture (UCCC Code C)

Catalog Description
(Prerequisites: INDT 4224). Three Hours Lecture. Discussion and applications of Six Sigma within the lean manufacturing environment, to increase quality, reduce costs, and to make manufacturers more competitive.

Course Objectives
Upon completion of the course, the student will be able to:
1. Apply the correct use of the tools employed in Six Sigma, and where to use them. (CFPO 3, 7, 8, 9, 11, 12)
2. Explain the benefits of Six Sigma. (CFPO 3, 7, 8, 9, 11, 12)
3. Assess the implementation of Six Sigma. (CFPO 3, 7, 8, 9, 11, 12)
4. Identify possible pitfalls to the implementation of Six Sigma. (CFPO 3, 7, 8, 9, 11, 12)

Topics Covered in the Course: 45 hours

1. Definition and Motivation for Lean Six Sigma (3 Contact Hours)
2. History and Fundamentals (3 Contact Hours)
3. Benefits of Lean Six Sigma (2 Contact Hours)
4. Improving Quality and Reducing Costs (2 Contact Hours)
5. Metrics and Performance Measurement (2 Contact Hours)
6. Deployment Alternatives (2 Contact Hours)
7. Overview of Statistical Analysis (3 Contact Hours)
8. General Approach to Implement Lean Six Sigma (12 Contact Hours)
   a. Overview of Lean Six Sigma Approach and Systems (1 Hour)
   b. Implementation (11 Hours)
      i. Establish Team and Define Project (1 Hour)
      ii. Review Existing Records and Data (1 Hour)
      iii. Create Process Flowcharts and Conduct Throughput Analyses (1 Hour)
      iv. Collect Process and Quality Data (1 Hour)
      v. Analyze Data by Work Unit and Establish Baseline (1 Hour)
      vi. Identify Major Cost and Quality Improvement Opportunities (1 Hour)
   vii. Determine, Evaluate, and Select Improvement Alternatives (1 Hour)
     viii. Develop Lean Six Sigma Deployment and Execution Plan (1 Hour)
     ix. Execute and Implement Lean Six Sigma Plan (1 Hour)
     x. Validate Program versus Goals (1 Hour)
     xi. Monitor and Continually Improve Performance (1 Hour)
9. Training and Implementation (2 Contact Hours)
10. Common Pitfalls (2 Contact Hours)
11. Best Practices and Lessons Learned (2 Contact Hours)
12. Case Studies (10 Contact Hours)
   a. Case Study 1: Final Assembly Operations (2.5 Hours)
   b. Case Study 2: Manufacturing—Small and Medium-Sized Operations (2.5 Hours)
   c. Case Study 3: Manufacturing—Automotive Supplier (2.5 Hours)
   d. Case Study 4: Material Recovery and Recycling Processing Facilities (2.5 Hours)

Text(s)

**Description of Instruction**
(Campus 1) Lecture. (UCCC Code C) The class will be a combination of interactive lectures and class discussions combined with cooperative learning in-group activities.

(Campus 5) Lecture. (UCCC Code C) The class will be a combination of online lectures, discussion boards, combined with at home laboratory exercises and simulations.

**Honor Code**
(Campus 1 and 5) Mississippi State University has an approved Honor Code that applies to all students. The code is as follows:

“As a Mississippi State University student I will conduct myself with honor and integrity at all times. I will not lie, cheat, or steal, nor will I accept the actions of those who do.”

Upon accepting admission to Mississippi State University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor Code. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the MSU community from the requirements or the processes of the Honor Code. For additional information visit: [http://www.honorcode.msstate.edu](http://www.honorcode.msstate.edu)

(Campus 5 specifically) Online tests will be administered with random ordered questions. All written assignments must be submitted through Turnitin.

**Technology**
(Campus 1) Lectures will be given via PowerPoint presentations, which will be available on Canvas. All exams, quizzes, and assignment will be on Canvas unless an in-class assignment/quiz is given, which will be announced. Assignments will be undertaken using the suite of tools available in Microsoft Office. Students are responsible for having access to the Internet for accessing Canvas, and Microsoft Office.

(Campus 5) Lectures will be given via voiced over PowerPoint presentations, which will be available on Canvas. All exams, quizzes, and assignments will be on Canvas. Assignments will be undertaken using the suite of tools available in Microsoft Office. Students are responsible for having access to the Internet for accessing Canvas, and Microsoft Office.

**Diversity**
Cultural diversity is encouraged through group work in this class.
Accommodations for Students with Disabilities
Students with disabilities in need of accommodations to meet the expectations of this course are encouraged to bring this need to the attention of the instructor and should register with the Office of Student Support Services as soon as possible. The Office of Student & Disability Support Services is located in 01 Montgomery Hall, (662) 325-3335, and http://www.sss.msstate.edu.

University Safety Statement:
Mississippi State University values the safety of all campus community members. Students are encouraged to register for Maroon Alert texts and to download the Everbridge App. Visit the Personal Information section in Banner on your mystate portal to register. To report suspicious activity or to request a courtesy escort via Safe Walk, call University Police at 662-325-2121, or in case of emergency, call 911. For more information regarding safety and to view available training resources, including helpful videos, visit ready.msstate.edu.

Field Component:
There is no field component for this class.

Evaluation of Student Progress
Student progress will be measured as follows:

Student Activities/Assignments
Quizzes: Quizzes will be scheduled during the course. These quizzes will be averaged and will constitute 40% of the final grade. Exams will be given through Canvas, unless announced. Quizzes will contain questions covering knowledge and understanding of the material, as well as explanation of this knowledge. Questions may be taken from the text, lecture materials, laboratory experiments, supplementary materials (handouts and/or readings), and from instructor demonstrations. The format of the quizzes will vary according to the nature of the covered material. (Objectives 1, 2, 3)

Case Studies: Two (2) case studies will be given near the end of the semester. These case studies will be concerned with the use of lean six sigma techniques to solve problems within a manufacturing enterprise. The problems will be given at the time the case study is announced. The case study will consist of a written report that will be submitted to Canvas. Case studies will constitute 40% of the final grade. (Objectives 1, 2, 3, 4)

Students will complete a final exam, which will cover the topic areas in the course. (Objectives 1, 2, 3)

Evaluation Weights:
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<thead>
<tr>
<th>Activities/Assignments</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Quizzes</td>
<td>40%</td>
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<tr>
<td>Case Studies</td>
<td>40%</td>
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<tr>
<td>Final Exam</td>
<td>20%</td>
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<tr>
<td>Total</td>
<td>100%</td>
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Grading Scale: The following is the grading scale for this course.

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<tr>
<th>Letter Grade</th>
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<tbody>
<tr>
<td>A</td>
<td>90.00% or higher</td>
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<tr>
<td>B</td>
<td>80.00% - 89.99%</td>
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<tr>
<td>C</td>
<td>70.00% - 79.99%</td>
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<tr>
<td>Grade</td>
<td>Percentage Range</td>
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<tr>
<td>-------</td>
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<tr>
<td>D</td>
<td>60.00% - 69.99%</td>
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<tr>
<td>F</td>
<td>59.99% or lower</td>
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**Attendance Policy**
In accordance with university policy (AOP 12.09), students should attend all classes. When an absence from class is essential, the student must inform the instructor via email, before the absence if possible, and provide appropriate documentation. An excused absence is defined by AOP 12.09. [http://www.policies.msstate.edu/policypdfs/1209.pdf](http://www.policies.msstate.edu/policypdfs/1209.pdf)

**Campus 1 Face-to-Face**
Role will be taken at the beginning of each class meeting. **If you are not present when the role is taken you will be counted absent.**

If a student misses more than three (3) classes with unexcused absences, you will have 10% deducted from your final grade.

**Campus 5 Distance**
This class is in an online format. Attendance will be determined through the regular opening of lectures, quizzes and assignments, as well as the timeliness of quiz and assignment submission. If you do not open the lecture during the week it is released, or submit quizzes and assignments on time more than five (5) times during the semester, you will have 10% deducted from your final grade.

**Title IX Policy**
MSU is committed to complying with Title IX, a federal policy that prohibits discrimination, including violence and harassment, based on sex. This means that MSU’s educational programs and activities must be free from sex discrimination, sexual harassment, and other forms of sexual misconduct. If you or someone you know has experienced sex discrimination, sexual violence and/or harassment by any member of the University community, you are encouraged to report the conduct to MSU’s Director of Title IX IEEO Programs at 325-8124 or by e-mail to titleix@msstate.edu. Additional resources are available at [http://www.msstate.edu/web/security/title9-12.pdf](http://www.msstate.edu/web/security/title9-12.pdf) or [http://students.msstate.edu/sexualmisconduct/](http://students.msstate.edu/sexualmisconduct/).

**Bibliography**


