IT 465  
Lean Manufacturing  

Instructor:  Dr. Miranda Smith  
Class Hours:  8am – 4:30pm  
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Course Content:  This course will cover the principles and techniques of Lean Manufacturing.  Major topics covered include lean principles, 5S, Value Stream Mapping, Total Productive Maintenance, Manufacturing/Office Cells, Setup Reduction/Quick Change-over, Pull System/Kanban, Continuous Improvement/Kaizen, Lean Six Sigma, Lean Simulation, and other modern lean manufacturing techniques and issues.  

Textbooks:  
- *The Lean Pocket Guide*, Donald Tapping. ISBN: 0-9770720-1-0, **not required to purchase**  

Evaluation:  

Exam 1:  Terms & Definitions (World Class Manufacturing Text)  
100 points  
Exam 2:  Multiple-Choice – Part I Lean Principles (Lean Thinking Text)  
100 points  
Project:  Application of Lean Principles  
Includes: oral presentation & written report  
5 Cited Authors with written report  
300 points  
Participation & Attendance  
+/- 5% points  

Grading:  

A  90-100%  
B  80-89%  
C  70-79%  
D  60-69%  
F  <60%  

Equipment:
Scientific Calculator, Pencil, Eraser, Graph Paper, Ruler

**Grading Policy:**

No late homework will be accepted and missed exams have a 20% penalty unless an appropriate, PRIOR excuse is given to the instructor. The missed exam must be completed on the make-up date set by the instructor.

**Academic Conduct:**

Cheating on examinations, submitting work of others students as your own or plagiarism in any form will result in penalties ranging from an F on the assignment to expulsion from the University, depending on the seriousness of the offense.

**Major Topics:**

- Lean Principles
- 5S / Visual Controls
- Value Stream Mapping
- Total Productive Maintenance (Preventive / Predictive)
- Manufacturing / Office Cells
- Setup Reduction
- Quick Change-over
- Pull System / Kanban
- Continuous Improvement / Kaizen
- Lean Six Sigma
- Lean Simulation
- Other methods, poke-yoke, takt time, etc.

**Minimum Student Competencies:**

- Explain the importance of implementing lean manufacturing.
- Describe the five key principles that guide lean thinking.
- Describe the eight general types of waste.
- Explain the differences between type one muda and type two muda.
- Describe customer satisfaction. Explain how higher customer satisfaction lead to lower costs.
- Describe 5S and its implementation steps.
- Describe 5 Whys.
- Explain the differences between value-added and non-value-added work.
- Describe Value Stream Mapping and demonstrate how to carryout this process.
- Describe and compute Takt time.
- Describe Poka-Yoke.
- Describe Total Productive Maintenance and its implementation steps.
- Compute Equipment Availability, Equipment Quality Performance, and Equipment Efficiency Performance.
• Describe various maintenance strategies (reactive maintenance, preventative maintenance, predictive maintenance, corrective maintenance, and maintenance prevention).
• Describe Autonomous Maintenance.
• Describe Manufacturing/Office Cells and the implementation steps.
• Describe the benefits of Manufacturing Cells.
• Describe Setup Reduction and its implementation steps.
• Explain how Setup Reduction reduces inventory.
• Explain how Setup Reduction improves quality.
• Explain the differences between internal setup and external setup.
• Describe Inventory Kanban and the implementation steps.
• Explain the differences between Withdrawal Kanban, Production Kanban, and Signal Kanban.
• Explain how Kanban reduce waste.
• Describe Kaizen and its implementation steps.
• Explain the differences between Kaikaku and Kaizen.
• Describe how a company can implement both lean manufacturing and six sigma.
• Describe lean simulation and its benefits.