IT 465
Lean Manufacturing

Instructor Information
Instructor: Dr. Feng-Chang Roger Chang
Class Meeting Times: 11:00am-12:15pm, TR
Course Location: EGRA219
Office Hours: 1:30-4:30pm, TR or by appointment, EGRD129
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Course Objective
The objective of this course is to introduce the basic principles and techniques of lean manufacturing. Major topics covered include lean manufacturing overview, lean thinking, lean manufacturing implementation, 5S, value stream mapping, error-proofing/Poka-Yoke, total productive maintenance, manufacturing/office cells, setup reduction/quick changeover, pull system/Kanbans, continuous improvement/Kaizen, and other modern lean manufacturing techniques and issues.

Course Materials
- Equipment: A hand-held scientific calculator.

Graded Items
- Exam 1 30%
- Final Exam (12:50-2:50pm, 5/5/14 Monday) 30%
- Quizzes 20%
- Homework 15%
- Class Participations and Attendances 5%

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

Lessons (Topics)
1. Lesson 1: Lean manufacturing overview and lean thinking
2. Lesson 2: Lean manufacturing implementation
3. Lesson 3: 5S
4. Lesson 4: Value stream mapping
5. Lesson 5: Error-proofing/Poka-Yoke
6. Lesson 6: Total productive maintenance
7. Lesson 7: Manufacturing/Office cells
8. Lesson 8: Setup reduction/Quick changeover
9. Lesson 9: Pull system/Kanbans
10. Lesson 10: Continuous improvement/Kaizen

**Student Learning Objectives**
At the end of the course, the student should be able to:

- 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 carry out 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 Kanbans and the implementation steps.
- Explain the differences between Withdrawal Kanban, Production Kanban, and Signal Kanban.
- Explain how Kanbans reduce waste.
- Describe Kaizen and its implementation steps.
- Explain the differences between Kaikaku and Kaizen.
Late Work 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.