QEM 530 001
Lean Manufacturing II
Fall 2013

Instructor Information
Instructor: Dr. Feng-Chang Roger Chang
Class Meeting Time: 3:30pm-5:50pm, T
Course Location: EGRD102
Office Hours: 9:00am-12:00noon, TR or by appointment, EGRD129
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Course Objective
The objective of this course is to learn the knowledge and skills needed to apply lean principles and tools to achieve improvement locally within a work group; to integrate lean activities to transform and sustain lean operation of a complete value stream; and to integrate lean and other methodologies including six sigma and Theory of Constraints (TOC).

Course Materials
- Equipment: A hand-held scientific calculator

Graded Items
- Exam 1 20%
- Final Exam (8:00pm-10:00pm, 12/9/2013 Monday) 20%
- Quizzes 20%
- Homework 20%
- Class Participations and Attendances 20%

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

Lessons (Topics)
1. Lesson 1: Overview and introduction of value stream management
2. Lesson 2: Commit to lean and choose the value stream
3. Lesson 3: Learn about lean (part 1)
4. Lesson 4: Learn about lean (part 2)
5. Lesson 5: Map the current state and identify lean metrics
6. Lesson 6: Map the future state
7. Lesson 7: Create and implement kaizen plans
8. Lesson 8: Integrate lean manufacturing, six sigma and Theory of Constraints (TOC)

**Student Learning Objectives**

At the end of the course, the student should be able to:

- Describe and distinguish the differences between ‘doing lean’ and ‘being lean’.
- Describe the Value Stream Management process and steps.
- Describe the Value Stream Management Storyboard.
- Describe the critical behaviors of a successful Lean Manufacturing initiative.
- Describe key lean principles.
- Describe and distinguish the differences between ‘management push’ and ‘worker pull’.
- Describe the ‘catchball’ process in Value Stream Management.
- Describe short-term pains and long-term gains associated with the transformation to Lean.
- Describe value stream.
- Describe the methods of Product-Quantity (PQ) Analysis and Product-Routing (PR) Analysis and explain how they can be used to decide which value streams to target for improvement.
- Describe the LEarn and then APply (LEAP) approach to learning.
- Describe the Lean training plan.
- Describe and distinguish the differences between ‘Lean thinking’ and ‘traditional thinking’ approaches toward cost reduction principle.
- Describe the ultimate lean target related to the total elimination of wastes.
- Describe the two pillars of the Toyota production System: JIT production and Jidoka.
- Describe the 5S system.
- Describe the three stages of Lean application: Demand, Flow, and Leveling.
- Describe and apply the tools and concepts to determine and meet customer demand: takt time, pitch, takt image, buffer inventories, safety inventories, finished-good supermarket, and lights-out manufacturing.
- Describe and apply the tools and concepts to establish flow: continuous flow, work cells, line balancing, standardized work, quick changeover, autonomous maintenance, in-process supermarkets, kanban system, first-in/first-out (FIFO) lanes, and production scheduling.
- Describe and apply the tools and concepts to level production: paced withdrawal, Heijunka, Heijunka box, and the runner.
- Describe and apply the Value Stream Mapping process: map the current state, identify lean metrics, and map the future state.
• Describe and apply Kaizen process.
• Describe how a company can integrate lean manufacturing, six sigma and TOC.
• Describe and apply the Lean/TOC simulation.

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.