

SIE 482
Lean Operations and Manufacturing Systems
Spring 2022

Class hours: Mondays & Wednesdays 6:00 – 7:15 p.m.

Course URL: This course uses D2L

Instructors: Anne McBride, Jim Pekny

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Office hours: By appointment; will attempt to be available after class

Designation: Elective in IE, SE, and EM Program

Prerequisite(s):

1. Concurrent registration, Probability and Statistics – SIE305

Text:

Goldratt, *The Goal*, North River Press, 2004 Third Edition

Overall educational goals:

- Understand relationship between Work in Progress, cycle time, takt
- Understand the integration of batch size, setup, manufacturing processes, and waste
- Understand techniques to sustain lean implementation
- Provide students with a comprehensive overview of lean manufacturing allowing them to contribute immediately to manufacturing, operations or service industries.

Lecture Notes: Lecture notes will be uploaded by 10:00 pm the day prior to class date. Therefore, students are required to visit the course web site and have materials ready before they come to class.

Course Content:

Week	Content Description	Assignment
Jan 12 (Wed)	Syllabus review, overview of major lean topics, history and fundamental purpose of lean manufacturing	HW: Read <i>The Goal</i> Due: Friday Jan 28
Jan 19	Constraints Management, Capacity and utilization modeling	HW 1: Capacity / utilization model Due: Wednesday Jan 26
Jan 24, 26	Before lean simulation (lego rocket); after lean simulation (lego rocket); history and fundamental purpose of lean manufacturing (cont. if needed).	HW 2: Goal paper – 3-4 page overview of key lean strategies Due: Monday Jan 31

Jan 31, Feb 2	<i>The Goal</i> discussion	Quiz 1: <i>The Goal</i>
Feb 7, 9	Visual Control Systems; 5S	HW 3: real-life visuals Due: Monday, Feb 14
Feb 14, 16	Pull systems; WIP/takt/inventory overview; inventory reduction; line balancing	HW 4: Kanban system design Due: Monday Feb 21 Quiz 2: Visual Controls, 5S
Feb 21, 22	Value stream mapping and process mapping; plan for every part	HW 5: Value stream map Due: Monday, Feb 28 Quiz 3: Kanban and inventory management
Feb 28, Mar 2	Mid-term review; Mid term Exam	Mid-term exam: Wed., Mar 2, 6:00 p.m.
Mar 7, 9	Spring Break	
Mar 14, 16	Setup Reduction (SMED), Error proofing (poka-yoke)	HW 6: SMED, error proofing Due: Monday, Mar 21
Mar 21, 23	Toyota Production System; Discrete Event Simulation	Quiz 4: setup reduction, error proofing
Mar 28, 30	Total Productive Maintenance (TPM); Traditional Maintenance	HW 7: TPM formula, calculation, card for machine Due: Monday, Apr 4
Apr 4, 6	Work measurement techniques	HW 8: Time study analysis Due: Monday, Apr 11
Apr 11, 13	Standard work sustainment; interrelationships of lean concepts; Work cell design and optimization	HW 9: Interrelationships Due: Monday, Apr 18 Quiz 5 Work Measurement
Apr 18, 20	Variability reduction	
Apr 25, 27	Mission Assurance management; Foreign object elimination; Material handling; Electrostatic discharge (ESD) awareness; Tool control	HW 10: Discipline audit form Due: Monday, May 02 Quiz 6 Variability reduction
May 2, 4	Review for Final Exam	
May 6?	Final Exam (Friday, May 6 – 4 hour window?)	8:30-10:30 pm – current plan

Grading:

1. Class homework: 25 %
2. Quizzes: 20 %
3. Midterm Exam: 25 %
4. Final Exam: 30 %

Course Rules:

1. Homework needs to be done individually unless otherwise instructed. Paper copies will usually be expected as well as loading to D2L. Homework assignments received after the D2L deadline will be graded at 50% off. Homework not turned in within 7 days of D2L deadline will receive a zero grade.

2. For group projects, each group should submit a single report listing all names involved. The same group must be used throughout the semester. Each group member must contribute equally to all projects.
3. Students are expected to attend all lectures.
4. The instructor reserves the right to give a pop quiz at any time.
 - Quizzes typically are on Wednesdays. You can not miss any quizzes or exams. Missed quizzes and exams will result in a zero grade.
 - If a student chooses to contest any grades, they must do so within seven (7) calendar days of grade disbursement.
7. All holidays or special events observed by organized religions will be honored for those students who show affiliation with that particular religion; Absences pre-approved by the UA Dean of Students (or Dean's designee) will be honored.
8. Students are not allowed to use pagers, cell phones and/or other unapproved electronic devices during the class.
9. Plagiarism and/or cheating is not allowed to any extent for the assignments, quizzes, and exams.
10. Threatening behavior by students is prohibited (refer to the University policy)
11. Students with Disabilities: If you anticipate the need for reasonable accommodations to meet the requirements of this course, you must register with the Disability Resource Center (DRC) and request that the DRC send official notification of your accommodation needs as soon as possible. Please plan to meet with one of us by appointment to discuss accommodations and how the course requirements and activities may impact your ability to fully participate.
12. The information contained in the syllabus (except the grade and absence policies) may be subject to change with reasonable advance notice, as deemed appropriate by the instructors.