

Lean Systems INSY 6800 - D01
Auburn University
Department of Industrial & Systems Engineering
Spring 2023 (Rev 0)

Course Description:

(3 semester hours). This course will cover the core elements of Lean Manufacturing. Lean Manufacturing was born out of necessity to compete in the global automotive industry. Toyota was a small company with limited resources that developed this alternative to Henry Ford's mass production system. The focus of this course is the development of the Toyota Production System, elements of Lean System Design, and the critical role all employees play in a lean organization. Prerequisites: None

Professional Objectives:

Upon completion of this course, students will be able to:

1. Explain the historical context that made possible the discipline of Lean Manufacturing.
2. Demonstrate implementation of elements of Lean system design.
3. Define the steps to transform a mass production system into a Lean system.
4. Defend the critical nature that culture plays in the success of a Lean organization.
5. Identify the common thread of standardization in process, design, facilities, management, and leadership.
6. Distinguish the philosophical shift in thinking from Return on Investment to Continuous Improvement.
7. Assess any manufacturing facility or system and easily highlight the opportunity and propose Lean system improvements.

Faculty:

Tom Devall: MAS Business Management, EDs Adult Education, Lean Six Sigma Black Belt, ISO Lead Auditor
Automotive: Chrysler – Manufacturing Area Manager, Process Reliability Manager, and Launch Coordinator
Aerospace: Teledyne Continental Motors – Director and Vice President of Manufacturing
tld0017@auburn.edu

Graduate Teaching Assistant: Expect an email response within 36 hours, excluding holidays and weekends.

Victoria Ballard, BS Chemical Engineering, MS Civil Engineering, MISE student, PhD student
victoria.ballard@auburn.edu

Text:

The Gold Mine: A Novel of Lean Turnaround: Freddy Balle, Michael Balle ISBN: 978-0974322568 – Any edition – Expect quiz questions - **Required**

The Machine That Changed the World: The Story of Lean Production: James Womack & Daniel T. Jones, ISBN: 978-0743299794 – Any edition – **Recommended**

Learning to See: Value Stream Mapping to Add Value and Eliminate MUDA: Mike Rother, John Shook, ISBN: 978-0966784305 – Any Edition - **Recommended**

Technology Requirements:

This fully online asynchronous course uses the Auburn University Canvas e-Learning (<https://auburn.instructure.com/>) system for the distribution of course materials, links to lectures, assessments, and interaction with faculty and classmates. Students are required to have access to a personal computer with a reliable high-speed internet connection and a plan for backup connectivity in cases of outages of primary sources. ProctorU plug-in is required for exams. Read the technical requirements statement on the Canvas course for more details on the software and hardware requirements for the course.

Office Hours:

Contact me to arrange a meeting, phone call, or Zoom meeting.

Phone: (334) 740-3905 (C) **Email:** devall@auburn.edu

Grade Ranges:

≥ 90% A, ≥ 80% B, ≥70% C, ≥60% D, <60% F

Final passing grades are A, superior; B, good; C, acceptable; D, passing; and S, satisfactory. Final failing grades are F.

Course Timing:

This course is designed to complete in-pace with the campus sections of the course, with some flexibility regarding when the work is completed during the week. Staying up to date each week with the material and assignments will offer the most benefit to your learning, understanding, and ability to apply the material from the class to your work and life. With the exception of the midterm exam, due dates for the course are set for Monday evenings at 11:59 PM.

Instructor Communication:

General and course-related questions are to be posted to the Virtual Office in Canvas, which is monitored frequently. Otherwise, the best method for contacting the instructors is by email. For course material/lecture-related questions feel free to contact Mr. Devall. For questions on assignments, due dates, etc, feel free to contact Victoria Ballard. Expect a reply within 36 hours (at the most), Monday through Friday. Use your Auburn email account for all class business – checking/responding each school day. Put only “INSY 6800-D01 + your full name” in the subject area. Students are required to check the Canvas course and Auburn University e-mail daily on weekdays for announcements and communication from the course instructor and GTA.

Lectures:

Lectures are recorded live Mondays and Wednesdays 8:00 AM-8:50 AM Central Time at the Auburn University Shelby Center, viewable in the Canvas course in the Panopto tab live during this time. **Panopto chat features are engaged during the lectures to allow you to ask questions live during the recording.** A GTA will be standing by during class to respond to you and ask your questions during the lecture! Lecture recordings are posted to Canvas within 3 hours of the class and are available for viewing for the rest of the semester. Any questions you have on lecture material after the live session can be emailed to Mr. Devall. If you ever find yourself in town, you are welcome and encouraged to attend in person.

Production Run Labs:

Three times this semester the Tiger Motors lab will be in full production with the campus students. The production runs' approximate dates are indicated on the course calendar. You are invited to log in live to watch and interact with the production run and evaluate the performance of the teams and give suggestions for improvement. Labs are scheduled Mondays and Tuesdays 2 PM – 4 PM Central Time. For students not available during this time, recordings will be available for viewing afterward. If you live near Auburn and would like to participate in the labs weekly there is an option for you to join us in person, please contact Tom Devall before the 5th day of class to arrange for this option. Additionally, if there is enough interest, once during the term, we are planning an “experience the lab” afternoon for distance students who might like to travel into town once during the semester to come to complete a production run. The date and details for this event will be provided in the Canvas course.

Evaluation of Student Performance:

Grades are calculated by dividing points earned by the points possible. Each assignment has a point value, please email the GTA immediately if you feel a grade has been posted in error.

Approximate points of assignment categories are shown below:

Assignment Category	Points Possible
Quizzes (10-12)	100
Discussions (3-4)	100
Assignments (8-10)	200
Kaizen Project (1)	200
Exams (2)	400
Total	1000

Quizzes: Quizzes over each module provide an opportunity to check your understanding of key points and concepts and practice for exams. Quizzes are auto-graded, offering up to three attempts, best attempt grade kept, and open notes.

Discussions: Discussions give opportunities for classmates to engage with the content and each other, to offer real-world applications, and get clarification on misunderstandings of the course content. Discussions require an initial post in response to a prompt and two additional posts to classmates that add to the discussion. Timing will vary for each discussion but will typically last a couple of weeks. Grading will be done according to the rubric posted in the Canvas course.

Assignments: Assignments are a combination of check-yourself quizzes with 3 attempts and open notes, discussion boards, and lab activities. Assignments are designed to give opportunities for checking understanding, applying content, and collaborating with classmates. Innovative lab assignments bring the Tiger Motors lab to you.

Exams: Two online proctored exams will evaluate students' understanding of the material. Exams are a combination of auto-graded questions and short answers. Exams have a time limit and one attempt. Proctor U will be utilized in the administration of both exams. Exam questions are based on the lectures, additional materials posted in Canvas, and assignments. No unannounced exams will be given in the course. After all the students have completed the assessment, exams can be reviewed by contacting the GTA and making a zoom appointment.

Kaizen (Continuous Improvement) Project: Two Options for the Project – Implement a Kaizen Project in your Workplace or Write a Research Paper

Write a Research Paper:

- **Goal:** Intended for graduate students to develop a deeper understanding of Continuous Improvement (Kaizen).
- **Length:** 5 pages, pictures, title page and references not included. A minimum of three references
- **Format:** 1.5 spacing, one-inch margins, New Times Roman 12 font.
- **Topic:** This can include but is not limited to the history, development, and application of Kaizen.
- **Grading Criteria:** Papers are graded on logic, flow, grammar, and understanding of Kaizen. Rubric provided in Canvas course with details.

-OR-

Implement Kaizen Project in Your Workplace:

- **Goal:** Intended for graduate students to develop a deeper understanding of Continuous Improvement (Kaizen) and demonstrate that understanding by designing and implementing a Kaizen project.
- **Report Length:** 5 pages, pictures, title page, and references not included. A minimum of three references. -OR- Voice-over PowerPoint presentation of the project
- **Format:** 1.5 spacing, one-inch margins, New Times Roman 12 font. – OR- 12-15 minute Voice-over PowerPoint presentation with project design, objectives, pictures of the project, metrics, and results.
- **Topic:** Project must be completed during the semester and approved by Mr. Devall prior to starting.
- **Grading Criteria:** A rubric is provided in the Canvas course describing grading criteria for both submission options.

Course Withdrawal

If you should choose to withdraw from the course, please send Mr. Devall an explanation as to why. We are always looking to improve this course and would like to know how we can better serve its customer, the students. Students may withdraw from the course until the 15th day of class without a grade penalty. A course withdrawal between the 6th and 15th day has a course drop fee of \$100. Withdrawals made from the 16th day through the 36th class day may be made with a grade of W on the transcript. Students who disappear from the course without completing the work are assigned a grade based on the completed work in the course. Incomplete grades are reserved for students with documented extenuating circumstances that arrange with Mr. Devall prior to the completion of the course.

Late-work Policy:

Quizzes and Assignments may be submitted after the due date for a late penalty of 10% per day. Discussions, Kaizen Project, and Exams must be submitted by the due date. No late submissions are accepted without a documented excused absence within one week of the due date.

Excused Absences:

Students are granted excused absences from class for the following reasons: Illness of the student or serious illness of a member of the student's immediate family, death of a member of the student's immediate family, trips for student organizations sponsored by an academic unit, trips for university classes, trips for participation in intercollegiate athletic events, subpoena for a court appearance and religious holidays. Students who wish to have an excused absence from this class for any other reason must contact the instructor in advance of the absence to request permission. The instructor will weigh the merits of the request and render a decision. When feasible, the student must notify the instructor prior to the occurrence of any excused absences, but in no case shall such notification occur more than one week after the absence. Appropriate documentation for all excused absences is required.

Make-Up Policy:

Arrangements may be made to make up a missed major examination (e.g., hour exams, mid-term exams) due to properly authorized excused absences. Except in unusual circumstances, such as the continued absence of the student or the advent of university holidays, a make-up exam will take place within two weeks from the time the student initiates arrangements for it. Except in extraordinary circumstances, no make-up exams will be arranged during the last three days before the final exam period begins. The format of the make-up exam may be in a different format and content than the exam given to the rest of the class.

INSY Departmental Academic Honesty Policy:

All portions of the Auburn University student academic honesty code (Title X11) found in the Tiger Cub will apply to this class. All academic honesty violations or alleged violations of the SGA Code of Laws will be reported to the Office of the Provost, which will then refer the case to the Academic Honesty Committee. **Academic misconduct can result in a course grade of "F" regardless of the number of points earned thus far in the course.**

Violations include, but are not limited to:

Cheating on an examination. This includes such things as copying from another's paper, using unauthorized notes, calculators, cell phones, blue-tooth and/or wireless devices, PDAs, laptop/pen tablet, etc., or giving or receiving unauthorized aid, such as trading examinations, whispering answers, passing notes, or using electronic devices to transmit or receive information.

Plagiarism. This is using someone else's work without giving credit. It is, for example, using ideas, phrases, papers, laboratory reports, computer programs, data - copied directly or paraphrased - that you did not arrive at on your own. Sources include published works such as books, movies, web sites, and unpublished works such as other students' papers or material from a research service. In brief, representing someone else's work as your own is academically dishonest. The risk of plagiarism can be avoided in written work by clearly indicating, either in footnotes or in the paper itself, the source of any major or unique idea or wording that you did not arrive at on your own. Sources must be given regardless of whether the material is quoted directly or paraphrased. Copying another student's assignment and putting your name on it is plagiarism. Copying an answer key from an instructor's guide is plagiarism. Copying work from a previous semester of the class is plagiarism.

Unauthorized collaboration. This is working with or receiving help from others (including AI) on graded assignments without the specific approval of the instructor. If in doubt, seek permission from the instructor before working with others. Students are encouraged to learn from one another: Form study groups and discuss assignments, but each assignment must be individual work unless specifically stated and turned in as a group assignment. You are encouraged to talk to one another about your assignments, however, all assignments must be done by the student(s) whose name is (are) on it!

Multiple submission. This means using the same work to fulfill the academic requirements in more than one course. Prior permission of the instructors is essential.

Diversity & Inclusion:

It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, religion, sexuality, disability, age, socioeconomic status, veteran status, ethnicity, race, and culture. All students in this course are expected to respect their fellow classmates and actively participate in fostering an inclusive learning environment. If you experience anything in this class that makes you feel uncomfortable, please bring it to my attention and we will formulate a response. If you would prefer to remain anonymous you may complete a Bias Incident Report which will maintain your confidentiality at: <http://studentaffairs.auburn.edu/bert/submit-a-report-of-bias/> **Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups.**

ADA Accommodations:

Students who need accommodations are asked to electronically submit their approved accommodations through AU Access and to make an individual appointment with the instructor during the first week of classes – or as soon as possible if accommodations are needed immediately. If you have not established accommodations through the Office of Accessibility, but need accommodations, make an appointment with the Office of Accessibility, 1228 Haley Center, 334-844-2096 (V/TT).

Mental Health:

If you are experiencing stress that feels unmanageable (personal or academic) during the semester, Auburn University's Student Counseling & Psychological Services (SCPS) offers a variety of services to support you. The mission of SCPS is to provide comprehensive preventative and clinical mental health services to enhance the psychological well-being of individual students, as well as the broader campus culture. As an instructor, I am available to speak with you regarding stresses related to your work in this course, and I can assist in connecting you with the SCPS network of care. You can schedule an appointment yourself with the SCPS by calling (334)844-5123 or by stopping by their offices on the bottom floor of Haley Center or the second floor of the Auburn University Medical Clinic.

If you or someone you know needs to speak with a professional counselor immediately, the SCPS offers counseling during both the summer term as well as the traditional academic year. Students may come directly to the SCPS and be seen by the counselor on call, or you may call 334.844.5123 to speak with someone. Additional information can be found at <http://wp.auburn.edu/scs>.

Emergency Contingency statement:

If normal class and/or lab activities are disrupted due to illness, emergency, or crisis situations (such as an H1N1 flu outbreak), the syllabus and other course plans and assignments may be modified to allow completion of the course. If this occurs, an addendum to this syllabus and/or course assignments will replace the original materials.

Course Schedule – INSY 6800 D01 Lean Systems Fall 2022

Tentative Dates and assignments for the course are shown below. The Canvas course will reflect the most up-to-date information.

Dates	Module	Reading in <u>The Gold Mine</u>	Assignment	Assessment
1/11-1/16	Module 0			Pre-Class Quiz
No Class 1/16 Martin Luther King Jr Holiday				
1/16-1/23	Module 1		Intro Discussion	
1/23-1/30	Module 2	Chapter 1	Leadership Checklist	Quiz 1
1/30-2/6	Module 3	Chapter 2	MOST	Quiz 2
2/6-2/13	Module 4	Chapter 3	Mass Production Run Report	Quiz 3
Production Run #1 2/6, 2/7 2-4 PM				
2/13-2/20	Module 5	Chapter 4	VSM Current Discussion 2	Quiz 4
2/20-2/27	Module 6		1 of 7 Quality Tools Presentation	Quiz 5
2/27-3/6	Midterm Review		5S	
Midterm Exam (3/1-3/3)				
Spring Break No Class 3/6-3/10				
3/13-3/20	Module 7	Chapter 5	Discussion 3 Kaizen Project topic approval	
3/20-3/27	Module 8	Chapter 6	Production Run Report	Quiz 7
Production Run #2 3/20, 3/21 2-4 PM				
3/27-4/3	Module 9	Chapter 7	Future State VSM	Quiz 8
4/3-4/10	Module 10	Chapter 8/9	Manufacturing Cells	Quiz 9
4/10-4/17	Module 11	Chapter 10	Discussion 4	Quiz 10
4/17-4/24	Module 12		Kaizen Project Report	Quiz 11
4/24-5/1	Final Review		Final Production Run Reflection	Post-Class Quiz
Production Run #3 4/24, 4/25 2-4 PM				
Finals Week – Exam 2 (4/26-5/1)				