

## **Lean Production Systems**

EIN 4451

**Class Periods & Location:** T | Period 6 (12:50 – 1:40 PM) MCCC 100

R | Period 8-9 (3 – 4:55 PM) LIT 101

**Academic Term:** Spring 2025

### ***Instructors:***

Dr. Katie Basinger, Ph.D.

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Office Phone: (352) 294-7730

Office Hours: TBD

### ***Teaching Assistants:***

- Graduate TA: Lan Zheng (
- Undergraduate Graders: TBD

### ***Course Description***

History of manufacturing. Principles, design, and analysis of lean manufacturing systems. Small lot production, setup-time reduction, continuous improvement. Principles and control of push and pull manufacturing systems. Production planning and operations scheduling (3 credits).

### ***Course Pre-Requisites***

ESI 3312 Operations Research I, ESI 3215C Data Analysis for Industrial Applications (ISE Stats).

### ***Course Co-Requisites***

None

### ***Course Objectives***

- Convey the general history of manufacturing systems
- Identify the design of difference between mass production and lean production
- Compare and contrast the culture, organizational structure and leadership in Mass and Lean environments
- List and describe the Types of Waste and why waste elimination is a core component of Lean Manufacturing
- List and describe lean functionality (i.e. quality, continuous flow, pull systems, 5S, Visual Control, Kanban, etc).
- Demonstrate the ability to draw a Value Stream Map of an actual manufacturing process.
- Use quantitative methods to model, analyze, and optimize production systems

### ***Materials and Supply Fees***

Not applicable.

**Professional Component (ABET):**

<b>Outcome</b>	<b>Coverage*</b>
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	Medium
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	Medium
3. An ability to communicate effectively with a range of audiences	Low
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	High
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	Low
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	Medium

**Required Textbooks and Software**

- Learning to See by Mike Rother and John Shook, Student Workbook

**iClicker:** This is a free app. See the link on Canvas for more information about getting signed up and added to the course.

Link to add class: <https://join.iclicker.com/OVNI>



**Recommended Materials**

Although these are not required texts to purchase. If you are going to work in the manufacturing field these are GREAT resources for you to read before you start!

- The Machine That Changed the World: The Story of Lean Production by James Womack, Daniel Jones, and Daniel Ross
  - ISBN-10 : 0743299795
- The Goal: A Process of Ongoing Improvement by Eliyahu M. Goldratt, Jeff Cox, et. Al.
  - Available on Audible
- The Toyota Way: 14 Management Principles from the World’s Greatest Manufacturer by Jeffrey Liker, Grover Gardener, et. al.
- Lean Six Sigma Pocket Toolbook by Michael George, John Maxey, et. al.
- Lean Thinking by James P. Womack and Daniel T. Jones

**Required Computer**

UF student computing requirement: <https://news.it.ufl.edu/education/student-computing-requirements-for-uf/>

**Course Format**

This course is delivered in-person. However, slides posted will not have all of the information. In class you will have the opportunity to follow along and fill in slides. There are in-class activities that are part of your grade. Exams will be scheduled during class time

- Exam Dates:
  - Exam 1: Thursday, Feb. 13th
  - Exam 2: Thursday, March 27th
  - Exam 3: Tuesday, April 29 10 – 12 (Exam week)

**Attendance Policy, Class Expectations, and Make-Up Policy**

- **Attendance is required for exams in-person. See the calendar. Getting the date wrong is not an excused absence.**
  - Excused absences must be consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation.
- Class Expectation: Come! This will be fun material to talk about and learn about! If you are going to be here be present!
- Assignments will be due at 11:59pm on the date assigned.
- **Special Policies: TBD on the first day of class**

**Evaluation of Grades – TBD on first day of class**

Assignment	Percentage of Final Grade
Homework	%
In-Class Assignments	%
iClicker	%
Exams (3) 15% each	45%
Total	100%

**Course Schedule**

*\*\* This is subject to change during the semester. I will post more detailed schedules every 2 weeks. If a change is necessary, I will send out an announcement on Canvas. Please read the announcements!*

Week(s)	Dates	Module	Assignment (*specific due dates for each assignment will be given when assigned in class)	Notes
1-3	1/13 - 2/2	1: History of Lean and its Modern Format.	Activate iClicker	1/20 MLK Holiday
			Identify Basic Concepts - In Class	
			5-Whys - In Class	
			Identify Waste - HW	
4-7	2/3 - 3/2	2: Lean Tools and Algorithms	Lot Sizing - In Class	
			Case Study - HW	
			Kanban - HW	
			Exam 1	
8-10	3/3 - 3/23	3: Value Stream Mapping		Spring Break 3/17 - 3/21 wk 10
			VSM Final State - HW	
11-15	3/24 - 4/23	4: Scheduling and Project Management	Exam 2	
			Intro to Scheduling - In Class	
			Job Shop Scheduling & CPM - HW	
			Job Shop - In Class	
			TCTO - HW	Thur 4/24 & Fri 4/25 Reading Days
Bonus	NA	Bonus Material for 6422	VSM Project	
16	4/29 - 5/5	Exam Week	Exam 3	Tuesday 4/29 10a-12p

**Grading Policy**

Percent	Grade	Grade Points
93 - 100	A	4.00
90.0 – 92.9	A-	3.67
86 - 89.9	B+	3.33
83 – 85.9	B	3.00
80.0 – 82.9	B-	2.67
76 - 79.9	C+	2.33
73 – 75.9	C	2.00
70.0 – 72.9	C-	1.67
66 - 69.9	D+	1.33
63 – 66.9	D	1.00
60.0 – 62.9	D-	0.67
0 - 59.9	E	0.00

- **A grade of C (73) or higher is required to “pass” this course.**

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

### ***Students Requiring Accommodations***

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

### ***Course Evaluation***

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

### ***In-Class Recording***

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

### ***University Honesty Policy***

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://sccr.dso.ufl.edu/process/student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

### ***Commitment to a Safe and Inclusive Learning Environment***

The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University’s core values, including the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information, and veteran status.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Undergraduate Coordinator
- HWCOE Human Resources, 352-392-0904, [student-support-hr@eng.ufl.edu](mailto:student-support-hr@eng.ufl.edu)
- Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, [pld@ufl.edu](mailto:pld@ufl.edu)
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, [nishida@eng.ufl.edu](mailto:nishida@eng.ufl.edu)

### ***Software Use***

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

### ***Student Privacy***

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

## **Campus Resources:**

### Health and Wellness

#### **U Matter, We Care:**

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

**Counseling and Wellness Center:** <https://counseling.ufl.edu>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

#### **Sexual Discrimination, Harassment, Assault, or Violence**

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the [Office of Title IX Compliance](#), located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, [title-ix@ufl.edu](mailto:title-ix@ufl.edu)

#### **Sexual Assault Recovery Services (SARS)**

Student Health Care Center, 392-1161.

**University Police Department** at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

### Academic Resources

**E-learning technical support**, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. <https://elearning.ufl.edu/>.

**Career Connections Center**, Reitz Union, 392-1601. Career assistance and counseling; <https://career.ufl.edu>.

**Library Support**, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

**Teaching Center**, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. <https://teachingcenter.ufl.edu/>.

**Writing Studio, 302 Tigert Hall**, 846-1138. Help brainstorming, formatting, and writing papers. <https://writing.ufl.edu/writing-studio/>.

**Student Complaints Campus:** <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>; <https://care.dso.ufl.edu>.

**On-Line Students Complaints:** <https://distance.ufl.edu/getting-help/>;  
<https://distance.ufl.edu/state-authorization-status/#student-complaint>.