



DATA SCIENCE AND BUSINESS ANALYTICS DEPARTMENT
MAN 4558 – Lean Operations Management
Spring 2022

Instructor

Mostafa K. Ardakani, Ph.D., P.E., PMP
Office: IST Building, Room 2035
Phone: 863-874-8533
Email: Mardakani@floridapoly.edu

Course Schedule & Location

- Monday, Wednesday, and Friday 11:00 – 11:50 pm [Jan 10 – April 27, 2022]
- Location: IST Building, Room IST-1017

Credit Hours: 3 (lecture)

Office Hours

Monday, Wednesday, and Friday 1:00 – 2:00 pm (or by appointment)

Course Website

The course has a website in Canvas.
<https://floridapolytechnic.instructure.com/courses/6141>

Catalog Course Description

This course discusses relationships with suppliers and customers, quality management, process improvement, and cost analysis. This course will introduce students to lean principles and practice in production and transactional business procedures. The course will provide the student with an introduction to lean operations describing how evaluations and assessments of operations systems are performed. Lean operation tools and techniques will be described and, in some cases, demonstrated in simulation exercises. Issues relating to employee involvement, improvement teams, training and culture will be presented. Planning for lean process implementation and the necessity of sustain improvements will be discussed. Examples of applications in manufacturing and business processes will be presented.

Prerequisites

MAN 2591 / MAN 3504 - Introduction to Operations and Supply Chain Management

Communication/Computation Skills Requirement (6A-10.030): No

Textbooks and Reference Materials

B1 [Required] Lean Operations Management: Lecture Notes, Concepts, and Exercises, 2nd Edition, 2019, By: Daniel L. Tracy, Thomas C. Martin, ISBN: 978-1524983628, Kendall Hunt Pub Co.

B2 [Required] The Toyota Way Fieldbook, 2nd Edition, 2021, By: Jeffrey K. Liker & Donald Meier, ISBN: 978-1260468526, McGraw-Hill.

B3 [Optional] Creating a Lean Culture: Tools to Sustain Lean Conversions, 3rd Edition, 2015, By David Mann, ISBN: 9781482243239, CRC Press – Taylor & Francis Group

Software and Equipment

None

Course Objectives

- Learn a brief history of manufacturing approaches employed and the background and philosophy of lean production.
- Learn the concept of waste and that the quest for truly lean production is a journey and not a destination.
- The need for strategy, alignment with other corporate objectives, and preparation for lean operation will be presented.
- Learn some evaluation techniques that one can use in preparation for and use in lean operation activities.
- Learn a set of approaches used in implementing lean operations. While these tools are often useful, they are not an end in themselves, and they are not necessarily the essence of lean operations either.
- Concepts such as workplace organization, pull production, cellular arrangement and layout improvement, visual management, quick change, mistake reduction, employee involvement, need for employee creativity and motivation for lean implementation will be discussed and examples will be given.
- Methods for promoting success in implementing lean transformations will be discussed.

Course Learning Outcomes

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

1. Comprehend lean evaluation techniques and approaches used in implementing lean operations. (Learning Level based on Anderson and Krathwohl's Taxonomy 2000: Understanding)
2. Comprehend case studies to understand how to correctly implement lean tools and implement a lean culture in an organization. (Learning Level based on Anderson and Krathwohl's Taxonomy 2000: Understanding)
3. Develop team skills by working as part of a team to apply the use of lean operations strategies and techniques to solve a simulated situation and prepare a report. (Learning Level based on Anderson and Krathwohl's Taxonomy 2000: Evaluating)

Alignment with Program Outcomes:

<i>Business Analytics Program Student Outcomes</i>	Course Learning Outcome		
	1	2	3
(1) Apply current business analytics concepts, techniques, and practices to solve business problems.	X		

(2) Analyze a given business problem using appropriate analytics techniques to generate insights and solutions.			X
(3) Communicate effectively insights, analysis, conclusions, and solutions to a diverse audience.		X	

	Course Learning Outcome		
<i>Mechanical Engineering Program Student Outcomes</i>	1	2	3
(1) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	X		
(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			
(3) An ability to communicate effectively with a range of audiences	X		
(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			
(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			X
(6) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions			
(7) An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.		X	

Grading

- Five Exams (5×10%)
- Quizzes (15%)
- Assignment (10%)
- Final Project (15%) detail will be provided in class and posted on Canvas
- Attendance (10%) {For each unexcused absence, you will receive 20 negative points. For instance, if you miss three sessions, you will get $10\% - (3)20\% = 4\%$ credits}

The following grading scale applies:

A	93% – 100%	B	83% – 86%	C	73% – 76%	D	63% – 66%
A–	90% – 92%	B–	80% – 82%	C–	70% – 72%	D–	60% – 62%
B+	87% – 89%	C+	77% – 79%	D+	67% – 69%	F	0% – 59%

Assignments:

Each two students will be assigned a topic from B2 reference to discuss it in class. Students will share their finding in five-to-seven-minute presentation at the beginning of the class. The goal is to help students be familiar with fourteen principals outlined by Toyota.

Quizzes: These will give students an idea of what to expect on exams and provide early feedback on your progress.

Project: A team of two/three students will select a project, any real-world problem relevant to the topics covered in class. Case studies discussed in class can provide you a great picture of similar projects. You need to have instructor approval before working on your project; the deadline to choose your project is before the spring break. Each team needs to submit their final report. Projects will be presented at the end of semester. Detailed instructions with specific guidelines and formatting will be available on canvas. The final report submission is due on the last day of class.

Rubric for Report and Presentations

The final presentations and reports will be evaluated using the rubrics included below.

Report Rubric

Objective	Category	Below Expectations	Weak	Average	Good	Excellent
	Score	1	2	3	4	5
Students write professional quality documents	Introduction	Opening is off-topic and inappropriate to the purpose, not concise and no clarity	Opening is somewhat related to the topic and appropriate to the purpose but is not concise and clear	Opening is related to the topic and appropriate to the purpose. Somewhat clear and concise	Opening is related to the topic and appropriate to the purpose. Clear and concise	Strong opening that is clear and concise
	Organization	Disorganized; incorrect format; unclear direction	Somewhat organized; incorrect format; unclear direction	Organized; correct format; unclear direction	Organized; correct format; clear direction	Correct formatting, strong clarity and organization in the development of main points
	Literature Review	Does not present information from any source	Presents information from irrelevant sources representing limited points of view/approaches	Presents information from relevant sources representing limited points of view/approaches	Presents in-depth information from relevant sources representing limited points of view/approaches	Synthesizes in-depth information from relevant sources representing limited points of view/approaches
	Research Design	Does not provide information on research design	Inquiry design demonstrates misunderstanding of the methodology or theoretical framework	Critical elements of the methodology or theoretical framework are missing, incorrectly developed or unfocused	Critical elements of the methodology or theoretical framework are appropriately developed however, more subtle elements are ignored or unaccounted for	All elements of the methodology or theoretical framework are skillfully developed and may be synthesized from across disciplines or relevant subdisciplines
	Analysis	Incorrect, Irrelevant, no supporting evidence	Correct, irrelevant, no supporting evidence	Correct, relevant, no supporting evidence	Relevant and correct with supporting evidence	Relevant, correct, complete, incorporates innovative insights
	Conclusion	Missing or content does not support conclusion	Conclusion irrelevant to the findings	Conclusion somewhat relevant to the findings	Conclusion relevant to the findings	Strong conclusion that is clear, complete and compelling
	Grammar & Spelling	Uses language that often impedes meaning due to errors	Uses language that often sometimes meaning due to errors	Uses language that generally conveys meaning to readers with clarity, although writing	Uses straightforward language that conveys meaning to readers.	Uses graceful language that communicates meaning to readers with clarity and

Attendance

Students in **face-to-face (this includes labs and C-courses)** courses are expected “to attend all of their scheduled University classes and to satisfy all academic objectives as defined by the instructor” (University Policy, FPU-5.0010AP).

If you know that you will miss a class for any reason discuss the situation with your instructor in a timely manner. **Attendance and participation accounts for 10% of your final grade in this course.** To implement this, student will be given quizzes, surveys, or questions during class to measure their engagements and monitor their attendance.

Exceptions to any attendance requirements may be made on a case-by-case basis.

I am a student; what should I do if I think I may have COVID-19?

Students who are showing symptoms or who have been exposed to COVID-19 are expected to stay in their residences (at home or in their dorm rooms) and immediately notify the FL Poly CARE manager at care@floridapoly.edu. The CARE Manager will work with each student to triage their individual situation and the CARE Manager will notify faculty of students who are not attending courses due to COVID-19 symptoms.

Late Work/Make-up work

Each student must keep current on assignments, quizzes and projects. Late assignments are not graded, unless permission has been obtained from the instructor in advance.

University Policies

- **Basic rules for in the classroom, IST, and Campus**

1. We highly recommend, until further notice, that you wear your face-covering during class and throughout the building at all times.
2. Absolutely **no eating or drinking** during class.

- **Reasonable Accommodations**

Florida Polytechnic University is committed to assisting students with disabilities and offering reasonable accommodations to those with documented eligibility. The Office of Disability Services (ODS) coordinates accommodations for students with disabilities in accordance with the ADA Amendments Act of 2008 (ADAAA), the Americans with Disabilities Act of 1990 (ADA), and Section 504 of the Rehabilitation Act of 1973. Reasonable accommodations are determined on an individual basis through an interactive process between you, ODS, and your instructor(s). If you have already registered with ODS, please ensure that you have requested an accommodation letter for this course and communicate with your instructor about your approved accommodations at your earliest convenience. If you are not registered with ODS but believe you have a temporary health condition or permanent disability requiring an accommodation, please contact ODS as soon as possible.

The Office of Disability Services (ODS):

DisabilityServices@floridapoly.edu

(863)874-8770

ASC East building

ODS website: www.floridapoly.edu > Student Affairs > Health Wellness > Disability Services

- **Accommodations for Religious Observances, Practices and Beliefs**

The University will reasonably accommodate the religious observances, practices, and beliefs of individuals in regard to admissions, class attendance, and the scheduling of examinations and work assignments. (See University Policy.)

- **Title IX**

Florida Polytechnic University is committed to ensuring a safe, productive learning environment on our campus that prohibits sex discrimination and sexual misconduct, including sexual harassment, sexual assault, dating violence, domestic violence and stalking. It is important for you to know that there are resources available if you or someone you know needs assistance. You may speak to your professor, but your professors have an obligation to report the incident to the Title IX Coordinator. It is an educational goal that you feel able to share information related to your life experiences in classroom discussions and in one-on-one meetings. However, it is requirement for university employees to share information with the Title IX Coordinator regarding disclosure. However, please know that your information will be kept private to the greatest extent possible. You will not be required to share your experience. If you want to speak to someone who is permitted to keep your disclosure confidential, please seek assistance from the Florida Polytechnic University Ombuds Office, BayCare's Student Assistance Program, 1-800-878-5470 and locally within the community at Peace River Center, 863-413-2707 (24-hour hotline) or 863-413-2708 to schedule an appointment.

- **Academic Integrity**

All students must commit to the highest ethical standards in completion of all academic pursuits and endeavors, whether in classroom or online environments: [Academic Integrity](#).

Student Record of Lectures

Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal educational use.

Recordings may not be used as a substitute for class participation or class attendance.

Recordings may not be published or shared in any way, either intentionally or accidentally, without the written consent of the faculty member. Failure to adhere to these requirements is a violation of state law (subject to civil penalty) and the student code of conduct (subject to disciplinary action).

Recording class activities other than class lectures, including but not limited to lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), and invited guest speakers is prohibited. For further information, go to [the Registrar's webpage](#) and click on [HB233 Guidance](#).

Tentative Schedule

Week	Date	Topic	Chapters	Quizzes
1	10-Jan	Course Overview, Syllabus Review		
1	12-Jan	Lean Operations management and its relationship to other functional areas in organizations	B1-Ch1	
1	14-Jan	Transformation process, value creation, and their relationship to operations management	B1-Ch1	
2	17-Jan	Martin Luther King Jr. Holiday-No Class		
2	19-Jan	Operations Strategy and Competitiveness	B1-Ch2	Quiz 1
2	21-Jan	Relationships between strategy, core competencies, and competitive priorities	B1-Ch2	
3	24-Jan	Productivity and how it is measured	B1-Ch2	
3	26-Jan	Review and Problem Solving		
3	28-Jan	Exam 1: Chapter 1-2 [B1]		
4	31-Jan	Forecasting and the forecasting process	B1-Ch3	
4	2-Feb	Use and interpret time series forecasting methods	B1-Ch3	
4	4-Feb	Compute and interpret forecast accuracy measures	B1-Ch3	
5	7-Feb	Product Design and Process Selection	B1-Ch4	
5	9-Feb	Product design and implications for eventual market success	B1-Ch4	Quiz 2
5	11-Feb	Process selection and implications for maximum value lean transformations	B1-Ch4	
6	14-Feb	Exam 2: Chapter 3-4 [B1]		
6	16-Feb	Lean Operations Management and Lean Systems	B1-Ch5	
6	18-Feb	Philosophy of lean operations management	B1-Ch5	
7	21-Feb	Concepts of lean systems	B1-Ch5	
7	23-Feb	Supply Chain Management	B1-Ch6	
7	25-Feb	Basics of supply chain management decisions	B1-Ch6	
8	28-Feb	Importance of information sharing and visibility	B1-Ch6	
8	2-Mar	Case study Discussion		
8	4-Mar	Review and Problem Solving		
9	7-Mar	Exam 3: Chapter 5-6 [B1]		
9	9-Mar	Spring Break - No Classes		
9	11-Mar	Spring Break - No Classes		
10	14-Mar	Spring Break - No Classes		
10	16-Mar	Total Quality Management	B2-Ch7	
10	18-Mar	Total quality management and the quality tools	B2-Ch7	
11	21-Mar	Theories of historical quality gurus	B2-Ch7	
11	23-Mar	Statistical Process Control	B2-Ch8	Quiz 3
11	25-Mar	Control charts and their application	B2-Ch8	

12	28-Mar	Process capability and the concept of 6 σ quality	B2-Ch8	
12	30-Mar	Review and Problem Solving		
12	1-Apr	Exam 4: Chapter 7-8 [B1]		
13	4-Apr	Capacity Planning and Facility Location	B2-Ch9	
13	6-Apr	Balancing production and service flow with market demand	B2-Ch9	
13	8-Apr	Decision support tools in capacity planning	B2-Ch9	
14	11-Apr	Evaluating Push Versus Pull Systems	B2-Ch13	Quiz 4
14	13-Apr	Principles of lean manufacturing	B2-Ch13	
14	15-Apr	Kanbans, quality control	B2-Ch13	
15	18-Apr	Workplace layout	B2-Ch13	
15	20-Apr	Review and Problem Solving		
15	22-Apr	Presentations		
16	25-Apr	Presentations		
16	27-Apr	Presentations		
Exam Week	TBD	Exam 5: Ch 9 and 13 [B1]		

This schedule might be modified as required by the progression of the class.

Important Dates

January 10 – 14	M-F	Drop/Add Week
January 14	F	Withdrawal Without Academic Penalty Deadline (W assigned)
January 17	M	Martin Luther King Jr. Holiday - No Classes
March 5– 13	Sat-Sun	Spring Break - No Classes
April 27	W	Last Day of Classes
April 28 – 29	Th, F	Reading Days - No Classes
April 30 & May 1– 5	S, M-Th	Final Exams
May 11	M	Final Grades Available Online