Course E-Syllabus

1	**Course title**	Lean and Agile Management and Continuous improvements
2	**Course number**	**0906777**
3	**Credit hours**	3
	Contact hours (theory, practical)	Theory 3 hours per week
4	**Prerequisites/Corequisites**	-
5	**Program title**	M.Sc. INDUSTRIAL ENGINEERING / ENGINEERING MANAGEMENT
6	**Program code**	
7	**Awarding institution**	The University of Jordan
8	**School**	Engineering
9	**Department**	Industrial Engineering
10	**Level of course**	Master level (9)
11	**Year of study and semester (s)**	**1st 2025/2026**
12	**Final Qualification**	M.Sc. INDUSTRIAL ENGINEERING / ENGINEERING MANAGEMENT
13	**Other department (s) involved in teaching the course**	
14	**Language of Instruction**	English/Arabic
15	**Teaching methodology**	☒On Campus ☐Blended ☐Online
16	**Electronic platform(s)**	☒Moodle ☒Microsoft Teams ☐Skype ☐Zoom ☐Others google classroom
17	**Date of production/revision**	

18 Course Coordinator:

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19 Other instructors:

Name:
Office number:
Phone number:
Email:

20 Course Description:

As per the approved Plan:
Multidimensional Culture of lean thinking and its applications, philosophy of lean management, philosophy of agility and its industrial applications, productivity-quality relationships and their improvement's programs, Push and pull production systems, waste and its causes and waste elimination methodologies, the most important tools, methods and practices of lean and agility; Six Sigma, 5S, JIT systems and its applications (Toyota), shop floor control policies, Kanban, avoiding mistakes (Poka Yoka), Intelligent systems, Value Stream Mapping, production smoothening, etc. The course includes an analysis of real practical cases.

21 Course aims and outcomes:

A- Aims:

- **Demonstrate** an in-depth understanding of Lean Six Sigma principles and their integration in continuous improvement initiatives across industrial, governmental, and organizational settings.
- **Apply** value stream mapping and the DMAIC (Define, Measure, Analyze, Improve, and Control) methodology to identify inefficiencies, reduce variability, and enhance process performance.
- **Utilize** appropriate Lean Six Sigma tools and techniques to analyze process data, support decision-making, and drive quality and efficiency improvements in real-world case scenarios.

B- **Intended Course Learning Outcomes (CLOs):**

Course Learning Outcome #	After successful completion of this course, the student will be able to	PLOs	JNFQ
CLO1	Explain lean concept and the lean thinking.	**PLO1**	**L9K1**
CLO2	Identify associated types of waste	**PLO1**	
CLO3	Identify some variant continuous improvement approaches.	**PLO1**	
CLO4	Explore the Six Sigma and lean six sigma.	**PLO1**	
CLO5	Apply the five-step DMAIC model to improve processes.	**PLO1**	
CLO6	Apply lean tools and techniques on a real-life project	**PLO1**	

The Program **outcomes addressed by the course**	**PLO1**
Relationship to JNFQ descriptors	**L9K1**

The JNQF descriptors		
Knowledge	**L9K1**	Specialized state-of-the-art knowledge in the field of the study.
	L9K2	Ability to think critically about the issues of knowledge in the field of learning and at the interface between different fields.
	L9K3	Sufficient knowledge of innovation strategies.
Skills	**L9S1**	Ability to create new skills, tools, and procedures at a high level, including new and emerging technological skills.
	L9S2	Ability to integrate knowledge from different areas of learning.
	L9S3	To demonstrate the ability to apply specialized skills in solving problems required in scientific research.
Competencies	**L9C1**	Managing ambiguous study contexts that require a new strategic approach.
	L9C2	Self-evaluation and responsibility for self-learning.
	L9C3	Taking responsibility for teamwork.
	L9C4	Contributing to vocational knowledge.
	L9C5	Ability to review team performance.
	L9C6	Dealing with complexity in scientific issues, managing them, and taking the initiative to solve them.

22. Topic Outline and Schedule:

محتوى المقرر					
أسبوع	ساعات	المخرجات	المواضيع	طرق التعليم والتعلم	أدوات التقييم
.1	3	-	Syllabus Discussion and General course orientation	Online Lecture using Microsoft Teams and/or Moodle	-
.2	3	**CLO 1**	General Introduction to Production Systems	Online Discussion and dialogue-based method	Midterm exam
.3	3	**CLO 1**	Lean Thinking: From Ford to Toyota Historical development of lean production Definition of lean production systems	Online Lecture using Microsoft Teams and/or Moodle	Midterm exam
.4	3	**CLO 2**	The 8 Deadly Wastes or Muda	Online Lecture using Microsoft Teams and/or Moodle	Midterm exam
.5	3	**CLO 3**	Principles of lean production and continuous Improvement Mass production versus lean production	Online Discussion and dialogue-based method	Midterm exam
.6	3	**CLO 3**	Learn agility and agile manufacturing.	Online Lecture using Microsoft Teams and/or Moodle	Midterm exam
.7	3	**CLO 3**	Just-In-Time (JIT) philosophy Continuous Improvement with Lean Systems Supply Chain Considerations in Lean Systems Close Supplier Ties Small Lot Sizes Single-digit setup	Online Discussion and dialogue-based method	Midterm exam
.8	3	**CLO 3**	Process Considerations in Lean Systems Pull Method of Workflow (LEAN) / Push Method of Workflow (NOT LEAN) Quality at the Source Lean System and Some Process Considerations Uniform Workstation Loads	Online Lecture using Microsoft Teams and/or Moodle	Midterm exam
.9	3	**CLO 3**	Standardized Components and Work Methods Flexible Workforce Automation 5S Total Preventative Maintenance Toyota Production System One-Worker, Multiple Machines	Online Discussion and dialogue-based method	Midterm exam

		Group Technology			
Midterm exam	Online Lecture using Microsoft Teams and/or Moodle	Value stream Mapping	**CLO 3**	3	.10
Midterm exam	Online Discussion and dialogue-based method	The Kanban system	**CLO 3**	3	.11
Final Exam	Online Lecture using Microsoft Teams and/or Moodle	Exploring Six Sigma and lean six sigma Statistics and variability reduction Lean Six Sigma implementation and Certification	**CLO 4**	3	.12
Final Exam	Online Discussion and dialogue-based method	The DMAIC model	**CLO 5**	3	.13
Final Exam	Online Lecture using Microsoft Teams and/or Moodle	Design for Six Sigma (DFSS)	**CLO 5**	3	.14
Course project projects and/or case studies	Collaborative learning by conducting and presenting course project projects and/or case studies	Case studies and/or real-life project Discussions	**CLO 6**	3	.15
Course project projects and/or case studies	Collaborative learning by conducting and presenting course project projects and/or case studies	Case studies and/or real-life project Discussions	**CLO 6**	3	.16
		Final examination		3	.17

- Teaching methods include In-Class meeting and traditional lecturing. Extra Synchronous lecturing/meeting when needed
- Evaluation methods include Exams, Home works, Quizzes, and/or Project…etc.

23 Evaluation Methods:

Opportunities to demonstrate achievement of the CLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	Period (Week)	Platform
Midterm Examinations	(30%)	Production Systems, Lean thinking, lean system design, variant lean tools and methods, 8-waste,	8	
Home works, Quizzes, and/or Project…etc.	(30%)	Variant		

	Final Examinations	(40%)	All Topics as per the course plan	16		

24 Course Requirements (e.g: students should have a computer، internet connection، webcam، account on a specific software/platform…etc):

Student should have scientific calculator, a computer and internet connection.

25 Course Policies:

A- Attendance policies: As per the below JU-Rules, all students are expected to attend all classes. Any student with more than 20% missing classes is subject to be failed in the class.

المادة (31): أ- إذا تجاوز غياب الطالب من دون عذر يقبله عميد الكلية (20٪) من مجموع الساعات المقررة لأي مادة، يحرم من التقدم للامتحان النهائي وتكون علامته (ج) في تلك المادة. وعليه إعادة دراستها إذا كانت إجبارية. وفي جميع الأحوال تدخل نتيجة ذلك الرسوب في حساب معدل علامات الطالب الفصلي والتراكمي لأغراض الإنذار والفصل.

ب. يعد الطالب الذي يتجاوز مجموع غيابه بعـذر يقبلـه عميد الكلية (20٪) من الساعات المقررة لمواد الفصل منسحباً من ذلك الفصل، ولا تحتسب هذه المدة من الحد الأعلى لمدة الحصول على الدرجة ولا من الحد الأعلى لمدة التأجيل، وذلك لمرة واحدة فقط.

B- Absences from exams and submitting assignments on time: all students should submit the assigned quizzes; short late submission is permissible if the student had internet issues during the exam. Exams is expected to be on campus and all absent students are subject to the university regulation for accepting their absence excuse through the office of the assistant dean for student affairs.

C- Health and safety procedures: none

D- Honesty policy regarding cheating, plagiarism, misbehavior: Discuss the assignments among yourselves. This is helpful to the learning process. However, direct copying of others work will NOT be allowed or tolerated and will result in a reduction of grade.

E- Grading policy:

Mid	:30%
Quizzes and assignments	:30%
Final	:40%
Total	:100%

F- Available university services that support achievement in the course: school of engineering computer labs.

26 References:

- Graeme Knowles, Six Sigma, Bookboon.com
- The instructor's video recordings and research paper summaries

- George, M. L., Maxey, J., Rowlands, D. T., & Price, M. (2005). The Lean Six Sigma pocket toolbook: A quick reference guide to nearly 100 tools for improving quality and speed (Kindle ed.). McGraw-Hill.

27 Additional information:

- Askin, R. G. and Goldberg, J. B., 2002, Design and Analysis of Lean Production Systems, John Wiley & Sons Inc., New York.
- Instructor's video recordings on the instructor's YouTube channel; links will be provided progressively in line with the course content

Name of Course Coordinator: ***Prof.*** ***Mohammad D. AL-Tahat*** Signature:  Date: ***8/10/2024***

Head of Curriculum Committee/Department: Signature:

Head of Department: Department: Signature:

Head of Curriculum Committee/Faculty: ---------- Signature: ----------

Dean: ---------- Signature: ----------