SENG 376 - LEAN SOFTWARE DEVELOPMENT (2024-2025)

Course Code	Course Name	Semester	
SENG 376	Software Project Management	Fall ☐ Spring ☒ Summer ☐	
Hours		**Credit**	**ECTS**
Theory	**Practice** / **Lab**	3	5
3	0 / 0		

Course Details	
Department	Department of Software Engineering (English)
Course Language	English
Course Level	Undergraduate ☒ Graduate ☐
Mode of Delivery	Face to Face ☒ Online ☐ Hybrid ☐
Course Type	Compulsory ☐ Elective ☒
Course Objectives	This course covers the fundamental principles, techniques, practices and related tools of Lean Six Sigma methods that underlay modern organizational productivity approaches which are one-to-one direct related to Agile Philosophy and Agile Project Management. Lean principles are critical and necessary to help software development in terms of **optimizing efficiency** and **minimizing waste** in the software development process. **Lean Software Development** (LSD) is an agile framework used to streamline and optimize the software development process. One of the main purposes of the course is to enhance student's awareness toward Lean Thinking and make the students understand *'Lean Is More Than a Collection of Tools'* or *'One-time Project'* but instead a continuous, long-term a cultural change. In this sense, through lectures, examples and case studies, this course will help the students understand the value of lean thinking, where the added value is for the customer, customer-oriented mindset, increased customer satisfaction, enhanced productivity and thus the importance of lean manufacturing and the philosophy of lean thinking. Students will learn how to improve processes by implementing Lean principles, effective utilization of resources and eliminating waste. They will also learn how to use the philosophy, core methods and tools of Lean manufacturing, and change management techniques on their path to success in real life.

Course Content	The start of your lean journey: lean philosophy & lean thinking; the origins of lean. The principles of lean and fundamentals of lean culture. The significance of elimination of waste, reduction of resource utilization, reduced lead times, and customer-oriented performance. The cornerstones of the lean business system; lean manufacturing and Toyota Production Systems and the fundamentals of the cultural change. How the philosophy and core methods of Lean manufacturing can be applied to the software development, business and real life cases. Value stream mapping of the current state (material and information flow) through the value chain and understanding where the added value is for the customer. Identification of waste, lean related inefficiencies and their root cause in the value stream. Development of improvement ideas and events, and establishment of continuous improvement and long-term lean based solutions and initiatives.
Course Method/ Techniques	Lecture ☒ Question & Answer ☒ Presentation ☐ Discussion ☒
Prerequisites/ Corequisites	-
Work Placement(s)	-

Textbook/References/Materials

- Wilson, L. (2010) ***How to Implement Lean Manufacturing***, McGraw-Hill Education.
- Earley, J. (2016) ***The Lean Book of Lean: A Concise Guide to Lean Management for Life and Business***, John Wiley & Sons.
- Womack, J.P., Jones, D.T. (2007) ***Yalın Düşünce***, Optimist Yayın Grubu.

Course Category				
Mathematics and Basic Sciences	☐		Education	☐
Engineering	☒		Science	☐
Engineering Design	☐		Health	☐
Social Sciences	☐		Profession	☐

Weekly Schedule

No	Topics	Materials/Notes
1	Lean Philosophy Introduced - History: The Origins of Lean	Lecture Notes-1
2	Understanding the Value and the Value Stream	Lecture Notes-2
3	Principles of Lean Management	Lecture Notes-3
4	'Wastes' of Lean Manufacturing and Eliminating Waste	Lecture Notes-4
5	The Lean Business System	Lecture Notes-5
6	People: The heart of Lean, Importance of Teamwork and Problem Solving Skills of Lean Teams	Lecture Notes-6
7	Cornerstones of the Lean Business System	Lecture Notes-7
8	Midterm Exam	

Weekly Schedule (Cont'd)

9	Stability, 6S – Workplace Organization, Visual Management, Standard Work	Lecture Notes-9
10	On-Time or Just-In-Time	Lecture Notes-10
11	The Significance of Lead Time, Lead Time Management, Strategies To Reduce Lead Time	Lecture Notes-11
12	Built-In-Quality – Right-First-Time, Poka Yoke, Root Cause Analysis, Problem Solving Tools	Lecture Notes-12
13	The Customer, Customer Oriented Thinking, Customer Satisfaction	Lecture Notes-13
14	Learning About Variation, The Impact of Variation, Controlling Variability and Managing Risk	Lecture Notes-14
15	Lean Engineering Basics - Applying Lean Fundamentals to Engineering Examples of Lean Manufacturing in Real Life	Lecture Notes-15
16	Final Exam	

Assessment Methods and Criteria

In-term studies	**Quantity**	**Percentage**
Attendance	at least %70 of the courses	%10
Lab		
Practice		
Fieldwork		
Course-specific internship		
Quiz/Studio/Criticize		
Homework		
Presentation / Seminar		
Project		
Report		
Seminar		
Midterm Exam		%40
Final Exam		%50
	Total	**100%**
Contribution of Midterm Studies to Success Grade		
Contribution of End of Semester Studies to Success Grade		
	Total	**100%**

ECTS Allocated Based on Student Workload

Activities	**Quantity**	**Duration (Hrs)**	**Total Workload**
Course Hours	14	3	42
Lab			
Practice			
Fieldwork			
Course-specific Work Placement			
Out-of-class study time	14	3	42
Quiz/Studio/Criticize			
Homework			

Presentation / Seminar			
Project			
Report			
Midterm Exam and Preparation for Midterm	1	20	20
Final Exam and Preparation for Final Exam	1	21	21
Total Workload			**125**
Total Workload / 25			**5**
ECTS Credit			**5**

Course Learning Outcomes	
No	**Outcome**
L1	Gains managerial, software development oriented sensitivity, perception and awareness.
L2	To be able to analyze by questioning, thinking critically, and to reflect this in her/his projects.
L3	Ability to think critically, make systematic criticism, and to make analysis in this direction and to be able to reflect these in her/his professional life.
L4	Ability to propose appropriate solutions to problems in line with the inferences and learnings.
L5	Ability to make use of different problem solving, decision making tools and techniques.
L6	Ability to work in groups and ability to presents project, related ideas, model, findings, outcomes.

Contribution of Course Learning Outcomes to Program Competencies/Outcomes

Contribution Level: 1: Very Slight, 2: Slight, 3: Moderate, 4: Significant, 5: Very Significant

	P1	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**P9**	**P10**	**P11**	**Total**
L1	2	5	5		4			4		5		25
L2		2	4	5						5		16
L3		5	5	5								15
L4		5				4	4	5				18
L5				5	4					5		14
L6						4	4			3		11
											Total	99