

# **Postgraduate Diploma in Lean Engineer**

**University of Debrecen  
Faculty of Engineering  
2021**

## **JUSTIFICATION OF THE PROGRAM LAUNCH**

### **1. Explaining the need for the program**

The aim of the program is to train professionals who will be able to rationalize production or services and all related processes in a results-oriented way by applying the Lean approach, based on the knowledge acquired in the postgraduate program. Students will learn how to increase efficiency and reduce losses, and will be able to apply them in their own organizations in the areas of manufacturing and logistics. The aim of the training is to develop the Lean philosophy, and improve efficiency throughout the organization generating measurable savings, which can even lead to targeting new market segments. By applying the philosophy, losses can be made visible and thus eliminated, and the production process can be adapted to customer needs.

The Lean methodology combines recognized practices of international quality development. By applying it, the processes of the organization are improved in the areas of production, administration and strategy development. Lean organizations deliver their products faster and more accurately, and are able to keep their costs lower than their competitors, thus their market position is constantly improving. A Lean company uses less of everything compared to mass production: it requires less human resources, time and inventory during production, thus minimizing the possibility of error.

The graduates will be able to apply continuous improvement and loss reduction methods in various manufacturing and service companies, thereby improving the following key performance indicators of the company: increasing productivity, reducing lead time, improving production/product cost ratio, reducing inventory, reducing production space requirements, speeding up product launch, reducing the additional costs of quality improvement.

### **2. Labor market demands**

More and more manufacturing and service organizations in the world adopting the Lean philosophy. Lean is a customer-centric business organization and management system, which aims to make businesses produce their products and services as efficiently as possible for their internal as well as external customers. Lean companies develop their activities primarily based on what is of use for the customer in creating value. Lean - one of the important elements of which is continuous development - is undergoing a transformation itself as nowadays new ideas, tools, and methods for increasing customer satisfaction and creating more efficient operations are emerging after the production companies, reaching the service organizations, public administration, and healthcare.

### **3. Target group for the program/service**

The training is primarily aimed at engineers who are production managers, quality managers, Kaizen managers, and logistics managers in their workplace. We also welcome young graduates who have a passion for the subject and who would like to work in this field in the future.

## **STUDY PROGRAM**

**1. Responsible faculty:** University of Debrecen Faculty of Engineering

**2. Responsible instructor:**

Dr. Edit Szűcs (full professor); University of Debrecen, Faculty of Engineering, Department of Engineering Management and Enterprise

### **3. Objective**

The fundamental objective of the training is to provide the participating professionals with a general professional knowledge of the subject, based on which they can learn about the "Lean philosophy". By applying the philosophy, losses can be made visible and thus eliminated, and the production process can be adapted to customer needs. The Lean methodology combines recognized practices of international quality development. By applying it, the processes of the organization are improved in the areas of production, administration and strategy development. Lean organizations deliver their products faster and more accurately, and are able to keep their costs lower than their competitors, thus their market position is constantly improving. Lean is a system consisting of technical and management fields. Having acquired these skills, graduates will be able to build and operate lean systems.

### **4. Mode of study**

Full-time

### **5. Structure**

Duration: 2 semesters.

### **6. Methods**

The language of instruction is English. The training comprises lectures, practical classes, and specific measurements, supplemented by electronic notes published in certain fields. During the training, there is continuous electronic communication between students and instructors.

### **7. Assessment system for evaluating the participant's performance**

The assessment system is based on the mid-term and exam grades of – partly interdependent, partly independent – courses, the thesis and its defense, and the final exam.

### **8. Curriculum**

The course names, the number of classes per week, and the credit values are shown in the following curriculum.

Abbreviations: L= Lecture, P= Practice, E= Evaluation, C= Credits, e = exam, m = mid-semester grade

**University of Debrecen**  
**Postgraduate Diploma in Lean**  
**Engineer**

**Full-time**

No.	Course group	Course name	semester 1				semester 2			
			L	P	E	C	L	P	E	C
1	Professional subjects	Management Knowledge	2	0	e	4				
2		Quality Management	2	1	e	4				
3		Quality Improvement Tools	0	2	m	4				
4		Lean Management I	2	1	e	5				
5		Lean Methods and Tools I	0	2	m	5				
6		Production and Operations Management	2	0	e	4				
7		Measurement and Qualification I	1	1	m	4				
8		Organizational Theory and Behaviour					2	0	e	4
9		Lean Management II					1	1	e	5
10		Lean Methods and Tools II					1	2	m	5
11		Process Management					0	2	m	2
12		Performance Measurement and Business Valuation					2	0	m	3
13		Measurement and Qualification II					1	0	e	3
14		Maintenance Management					2	0	e	3
15		Thesis					0	2	m	5

	L	P	E	C	L	P	E	C
<b>Total per semester:</b>	9	7		30	9	7		30
number of courses ending with an exam			4				4	
number of courses ending with a mid-semester grade			3				3	
number of courses			7				7	
contact hours	16				16			

## 9. Completion of studies

### Thesis

The majority of students will likely choose a topic in connection with a problem related to their work, under the guidance of a recognized supervisor in the field. The Department of Engineering Management and Enterprise provides a thesis topic for students who do not have the opportunity to choose their own workplace topic. Students' choice of topic and supervisor is approved by the responsible person for the training program.

The thesis is assessed by the department. If the thesis is judged acceptable by the supervisors and the assessor, the student may be admitted to the final examination, where he/she will defend the thesis in front of a committee.

### Final exam

#### *Final exam requirements*

completing 60 credits as per the curriculum,  
 accepted thesis

#### *Final exam components*

Thesis presentation (8-10 minutes)

Defending the thesis by answering the final examination committee's questions.

Two oral exams on professional topics.

#### *Final exam topics:*

Quality Management, Quality Improvement Tools, Production Management,  
Lean Management, Lean Methods, Maintenance Management

#### *Final exam results:*

The final exam grade is determined by the grade awarded for the thesis (based on its defense) by the final examination committee, and the arithmetic mean of the two oral examinations.

### **Certificate**

#### *Certificate classification*

The arithmetic mean of the following:

- the arithmetic mean of the grades obtained in the exams of Lean management I and II
- the grades obtained at the final exam

### **10. Transferring formerly acquired knowledge and practice**

The courses in the curriculum of the Postgraduate Diploma in Lean Engineer, on the one hand, help to rationalize production and all the processes involved, and on the other hand, support the acquisition of an appropriate approach and corporate culture needed to lay the foundations for the introduction of Lean management. The knowledge acquired in former studies can only meet this requirement partially, thus formerly acquired knowledge and practice cannot be transferred.

#### **The necessary material conditions:**

The University of Debrecen, Faculty of Engineering has the laboratories (Lean lab) and software necessary for the training.

Laboratories: TQM Center, computer labs, manager labs, lean laboratory.

Software: MINITAB, QFD, ProcessModel, etc.

### **11. Expected launch date: September 2022**

## **Training Requirements and Learning Outcomes for Postgraduate Diploma in Lean Engineer**

**1. Program name:** Postgraduate Diploma in Lean Engineer

**2. Qualification:** Lean Engineer

**3. Field of training:** technical

**4. Application requirements:**

bachelor's degree in: Mechanical Engineering, Computer Science Engineering, Mechatronics Engineering, Architecture, Civil Engineering, Electrical Engineering, Chemical Engineering, Bioengineering, Environmental Engineering, or Management Engineering

**5. Duration:** 2 semesters

**6. Required credits:** 60 credits

**7. The competencies, knowledge, skills, and personal abilities to be acquired in the course, and applying the qualification in a specific environment and a system of activities.**

### **7.1. Competencies to be acquired**

- practice-oriented task analysis,
- problem solving with a system approach,
- rationalizing production processes,
- expert assistance in the development of lean systems,
- implementation and operation of lean systems.

### **7.2. Skills and knowledge to be acquired**

Skills to be acquired:

- rationalization of production processes,
- continuous improvement,
- applying loss reduction methods,
- mastering the lean philosophy,
- establishment and operation of lean systems.

Knowledge to be acquired:

- management knowledge,
- lean methods and tools
- quality improvement tools,
- maintenance management,
- performance measurement and business valuation

### **7.3. Personal abilities**

Analytical ability, problem-solving, system approach, communication, innovation, rationalization of production and its related processes in accordance with the competitive market, applying loss reduction methods

### **7.4. Applying the qualification in a specific environment and a system of activities:**

Students who complete the course are able to:

- rationalize production and the related processes independently for a given organizational unit using lean methods
- work as an independent consultant with a degree in engineering,
- apply continuous improvement and loss reduction methods.

### **8. Major areas of knowledge of the qualification and their credit values:**

Fundamental courses: 20 credits

Management Knowledge, Quality Management, Quality Improvement Tools, Production and Operations Management, Organizational Theory and Behavior

Professional courses: 23 credits

Lean Management, Lean Methods, Maintenance Management

Supplementary professional knowledge: 12 credits

Measurement and Qualification, Process Management, Performance Measurement and Business Valuation

Credit value of the thesis: 5 credits

Debrecen, May 8, 2021

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Dr. Zoltán Szilvássy  
rector