

## Course guide

### 205225 - ILC - Introduction to Lean Construction

Last modified: 19/04/2023

**Unit in charge:** Terrassa School of Industrial, Aerospace and Audiovisual Engineering  
**Teaching unit:** 758 - EPC - Department of Project and Construction Engineering.

**Degree:** BACHELOR'S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).  
BACHELOR'S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Optional subject).  
BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).

**Academic year:** 2023    **ECTS Credits:** 3.0    **Languages:** English

#### LECTURER

**Coordinating lecturer:** Forcada Matheu, Nuria

**Others:** Judez Muñoz, Pedro

#### PRIOR SKILLS

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#### REQUIREMENTS

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#### TEACHING METHODOLOGY

Lecture: Lecturers present concepts, principles and techniques, with the active participation of students.

Problem Based Learning: Lecturers and students resolve exercises and standard problems through specific techniques related to the theoretical contents and principles of the course.

Project Based learning: Students resolve complex problems through specific techniques related to the theoretical contents and principles of the course.

Self-study: Students diagnose their learning needs, in collaboration with the lecturers, and plan their own learning process.

#### LEARNING OBJECTIVES OF THE SUBJECT

Lean Construction is changing the framework in the Architecture, Engineering, Construction and Operational (AECO) industry, and building or infrastructure projects involving design by Architects / Engineers, construction by General Contractor and operation by an Owner. This course explains the current situation of low productivity in this industry, its root causes and the dominant paradigms. Then, it explains how the application of Lean philosophy is changing the design and construction process.

This course takes a holistic approach to the building life cycle, including design, construction, management, maintenance, and sustainability, emphasizing collaborative practices in management.

#### STUDY LOAD

Type	Hours	Percentage
Self study	45,0	60.00
Hours large group	30,0	40.00

**Total learning time:** 75 h

## CONTENTS

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### Module 1: Current framework of AECO Industry

**Description:**

This module covers the key principles of construction projects, the types of construction firms, the processes and phases in a construction project, and the role of the main stakeholders from initial briefing to managing the construction process.

**Full-or-part-time:** 10h

Theory classes: 4h

Self study : 6h

### Module 2: Lean Management in other industries

**Description:**

This module introduces the Lean philosophy and concepts, its origin in Toyota Production System for automobile production and its application to a wide variety of industries.

**Full-or-part-time:** 10h

Theory classes: 4h

Self study : 6h

### Module 3: Lean application to Construction Projects

**Description:**

Module 3: Lean application to Construction Projects

**Specific objectives:**

This module introduces the application of Lean concepts to Construction projects.

**Full-or-part-time:** 5h

Theory classes: 2h

Self study : 3h

### Module 4: Transformational Change

**Description:**

This module covers the concepts of Value Proposition, Learning to see Waste, Team Forming, Cost Forecasting, Target Value Design, Leadership and Respect for People.

**Full-or-part-time:** 16h

Theory classes: 6h

Self study : 10h

### Module 5: Integrated Project Delivery

**Description:**

This module explains how to achieve collaboration between the stakeholders; Early involvement of key actors; High-performing teams; Team partner selection; Choosing By Advantages; Project Conditions of Satisfaction; and Shared Risk & Rewards.

**Full-or-part-time:** 14h

Theory classes: 6h

Self study : 8h



## Module 6: Lean Project Delivery Methods

### Description:

This module aims at describing Lean project delivery methods: The Last Planner System; Reliable Promising; Cluster Groups; Work Planning; Continuous Improvement; Onboarding Team Members Plus / Delta; Big Room and Co-location; Value Stream Mapping; A3 Thinking; and Building Information Modeling (BIM).

### Full-or-part-time: 20h

Theory classes: 8h

Self study : 12h

## GRADING SYSTEM

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The final grade depends on the following three elements:

- 20%, in-class activities
- 40%, Group work
- 40%, Final Exam

The exam will be held the last day of class together with the group project presentation.

In case of getting a grade lower than 5, students will be able to opt for the resit exam which will be the day scheduled for the evaluation of the subject in the calendar of final exams. The final grade of the exam will be the highest one.

## EXAMINATION RULES.

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## BIBLIOGRAPHY

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### Basic:

- Seed, William R. Transforming design and construction: a framework for change. Lean Construction Institute, 2019. ISBN 9780578168425.
- Forbes, Lincoln H.; Ahmed, Syed, M. Modern construction: lean project delivery and integrated practices. Boca Raton: CRC Press, 2010. ISBN 9781420063127.