205225 - Introduction to Lean Construction

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

<table>
<thead>
<tr>
<th>Total learning time: 75h</th>
<th>Hours large group:</th>
<th>30h</th>
<th>40.00%</th>
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<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>0h</td>
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<tr>
<td></td>
<td>Hours small group:</td>
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<td></td>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
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<tr>
<td></td>
<td>Self study:</td>
<td>45h</td>
<td>60.00%</td>
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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.

**Learning time:**
10h  
Theory classes: 4h  
Self study: 6h

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# 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.

**Learning time:**
10h  
Theory classes: 4h  
Self study: 6h

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# 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.

**Learning time:**
5h  
Theory classes: 2h  
Self study: 3h

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# 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.

**Learning time:**
16h  
Theory classes: 6h  
Self study: 10h
### Module 5: Integrated Project Delivery

**Learning time:** 14h  
Theory classes: 6h  
Self study: 8h  

**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.

### Module 6: Lean Project Delivery Methods

**Learning time:** 20h  
Theory classes: 8h  
Self study: 12h  

**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).

### Qualification system

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. If 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.

### Regulations for carrying out activities

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### Bibliography

**Basic:**  
Seed, W. Transforming design and construction: a framework for change. Lean Construction Institute, 2019.  