

**AMERICAN UNIVERSITY OF BEIRUT
FACULTY OF ENGINEERING AND ARCHITECTURE**

**ENMG 642
Lean Engineering Concepts**

Dr. Issam Srour

COURSE DESCRIPTION

This course focuses on the emerging concept of lean performance in the construction industry. Topics covered include the origin of lean concepts, application to the design process, implementation in construction, contracting for lean performance, and value improving practices (e.g., benchmarking, constructability, value management).

COURSE OBJECTIVES

- The course introduces students to the concepts of lean performance.
- The course aims at introducing new trends in the application of lean concepts to the design and construction processes.

COURSE LEARNING OUTCOMES

The learning outcomes include:

- Develop an appreciation for lean concepts.
- Become familiar with the application of lean concepts to engineering and construction procedures.
- Develop an understanding of value improving practices.
- Study application of TQM concepts to the design and construction processes.

COURSE OUTLINE

1. What is, and why, lean engineering/construction?
2. Application of lean concepts to the design process
3. Implementing lean concepts in construction
4. Contracting for lean performance (partnering and alliancing)
5. Sustainability and Waste minimization
6. Value management
7. Constructability
8. TQM in the engineering/construction context
9. Benchmarking and Re-engineering

TEXTBOOKS

Required Textbooks:

1. Modern Construction: Lean Project Delivery and Integrated Practices by Lincoln Forbes, Syed Ahmed, CRC Press: Taylor & Francis Group

Suggested Textbooks:

1. The Goal: A Process of Ongoing Improvement by Eliyahu M. Goldratt and Jeff Cox, North River Press, 384 pages, ISBN : 0884271781.
2. The Machine That Changed the World by James P. Womack
3. Construction Management: New Direction, Denny McGeorge and Angela Palmer, Blackwell Publishing.

Students are directed to consult:

- *Reference articles on Moodle*
- *Engineering, and construction journals with articles related to lean construction*
- *Lean construction institute's website: <http://leanconstruction.org/>*

OFFICE HOURS

W & Th 3.30-5pm in Engineering Bechtel Building, 5th Floor (or by appointment, is04@aub.edu.lb)

STUDENT EVALUATION

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|--------------------------------------------------------|-----|
| • Attendance and participation | 10% |
| • Journal article critique & presentation (individual) | 15% |
| • Term project: report & presentation (group) | 35% |
| • Term exam | 40% |

Students are hereby instructed to review all relevant University rules and regulations including those related to attendance, cheating, plagiarism, misconduct, and academic integrity, among many others. It shall be expected that strict enforcement of these rules and regulations will be exercised.
