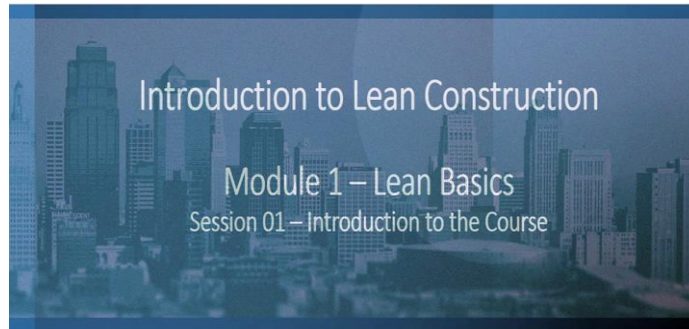


Introduction to Lean Construction
Professor Koshy Varghese
Department of Civil Engineering
Indian Institute of Technology Madras
Module 1

Course Contents, Long-term Goals, Structure and Module 1 Topics

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Prof. Koshy Varghese & Prof. N Raghavan, FNAE, FICE(UK), FIE(I)

Department of Civil Engineering

Indian Institute of Technology Madras



Good day everyone. Welcome to this course on Lean construction. We are happy that you chose to enroll in this course. And in this module, we will cover Lean basics. This course is offered by myself, Professor Koshy Varghese and Professor N Raghavan. We are faculty in the Department of Civil Engineering at the Indian Institute of Technology Madras. Now, in this session, we will cover what is the basic elements we are going to cover in this course.

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Introduction
Topics



1. *Course Contents- Structure-Pedagogy*
2. *Approach Taken for this Course*
3. *About NPTEL Certification Courses*

4. *Institute for Lean Construction Excellence (ILCE) – Background*
5. *Industry Perspectives on Lean - ILCE Directors Talks & Panel Discussion*



Introduction to Lean Construction: Module 1 – Lean Basics – Session 01 – Introduction to the Course



And the topics we will take up are here shown on the slide. So, we will take a little bit on the course content, the structure, the pedagogy of the course, the core approach taken for this course, there are many ways in which a Lean construction course can be taught, we will kind of explain the approach we are taking for this class, a little bit about NPTEL certification and what you can expect from the NPTEL certifications.

And Professor Raghavan will then explain ILCE, who is another supporter of this course. The background for ILCE as well as we will give a broad perspective of Lean with talks from ILCE directors, who would explain to you what they see as Lean construction and how it has impacted them.

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The slide titled "Course Contents" features a list of four items, each in a colored box with a corresponding number in a circle:

- 1 Overview of Project and Process Management Roles in Construction
- 2 Basics of Lean concepts/methods/tools relevant to construction
- 3 Exposure -Industry practices on implementing concepts/methods/tools
- 4 Links to more information/knowledge - Supplementary Module

The slide also includes the NPTEL logo in the top right corner, the ILCE logo in the bottom left corner, and a video inset in the bottom right corner showing a man in a blue shirt speaking at a podium. The text at the bottom of the slide reads: "Introduction to Lean Construction: Module 1 – Lean Basics – Session 01 – Introduction to the Course".

Now, when we go into the course content, there are specific content we will be covering in this module. And we will start out with what is the difference between project and process management. And, how process and project management should work together to be able to enable a construction project, and how the process side of it is what brings in the Lean concepts. So, this is where we will start in some ways, this is the fundamental or philosophical base for this module.

And then we will go into the concepts of Lean, the basic concepts, the methods used for Lean, as well as the tools that are relevant to construction. Now, this will form the core, where we talk about the tools and methods which support the concepts.


And following this, we will supplement it with industry practices on implementing these tools and concepts. A lot of times when you take the concepts and tools or when you take the tools

and try to implement it, it does not work the way we expect it to or the way it is given in a textbook, there are issues we will face when we implement on the field. We will bring case studies; we will tell situations in which the challenges are faced and how these challenges are being addressed by industry today.

And learning is a never-ending process. We have a lot of supplementary material on this, there is a lot more you can read to enhance your knowledge, enhance so much of information that is available out there, we will link you to supplementary reading material on the topics that we cover.



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Long-Term Goals



Enable participants to gain knowledge on Lean construction concepts practices to enable industry adoption in a standardized manner.

Community of Lean practitioners to enable knowledge sharing of best practices to facilitate industry wide adoption.



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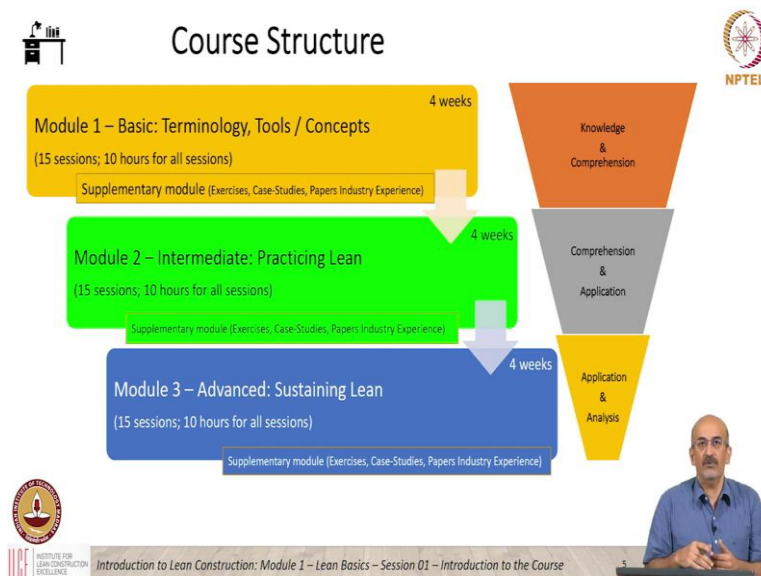
Now, where does this take us? The long-term goal here is to be able to actually gain knowledge on Lean construction, its concepts and practices and be able to adopt it in a fairly standardized manner. This is at least for the start, as we go deeper into Lean, standardization will be a little more difficult because each project site is different and each project site will require a little bit of custom look into its processes and the way it is operating. But ultimately, we would like to standardize, we would like to have the objective to be able to standardize because that is what brings in efficiency.

So, in some ways, at least, as we take the initial steps, we would like to have industry adoption in some sort of a standard form standard terminology, standard approaches to be able to get momentum on this topic and momentum on the way we start implementing this industry wide.

Now, once we start implementing this industry wide, we will have knowledge to share. We will have Lean practitioners, we will have people who bring their stories of how they implemented Lean on site, what worked, what did not, you know how it changed the way they did things.

And we would like to be able to create a community of these Lean practitioners to bring the knowledge to be able to share these best practices and be able to facilitate industry to adopt Lean in a wider way. So, these are the long-term goals of this. And our hope is that these, these initial seeds of planting Lean thinking ideas, Lean construction ideas to the participants will enable this.

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Now going into the course structure, in the broadest sense this course right now is structured into three modules. As you can see, the first module, which we are covering here talks about the basic terminology, tools and concepts. This will be in about 15 sessions and about 10 hours for all sessions. And, as discussed, there is a supplementary module, which gives you a lot more information, if you would like to go deeper into any topic.

Now, we look at it from the Bloom's Taxonomy side, we look at knowledge and comprehension as our objectives in the module 1. And I think if the participants come out with a sense of what is Lean, what is the terminology, what are the stories of implementing it, what can I expect initially, I think that would be kind of the agenda here.

As we go into module 2, we bring in more practice, we bring in more case studies, we bring into supplement modes few more advanced concepts of Lean, but at the same time trying to

ingrain Lean into the practice of Lean that through more case studies, be able to do comprehension as well as application of the Lean concepts.

And as we go into module 3, we look at sustainingly, how is, how do we make Lean not just a one project exercise, how do we promote the culture of Lean through the organization, how do we actually make Lean champions and be able to then spread the use of Lean and then get organizations to benefit, so and how do you design Lean programs.

So, as you can see, as we go from module 1 to module 2 to module 3, the topics become more advanced, it becomes less classroom oriented, more field oriented, more case study oriented, more organization oriented. And as, we go through, we will hope we can take the participants on this journey to be able to learn and implement Lean construction.

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Module 1 - Lean Basics

1. Introduction and Lean Overview (2 sessions)

2. Productivity Measurement & Improvement (2 sessions)

3. Sampling/ Survey Techniques (1.5 session)

4. Value Stream/ Process Mapping (VSM) (1.5 sessions)

5. 5S (2 sessions)

6. Collaborative Planning System (CPS)/ Last Planner® System (3 sessions)

7. Big Room Approach (1 session)

8. IT/BIM and Lean (1 session)

9. How to start practicing Lean Tools in Project Site-1 (1 session)

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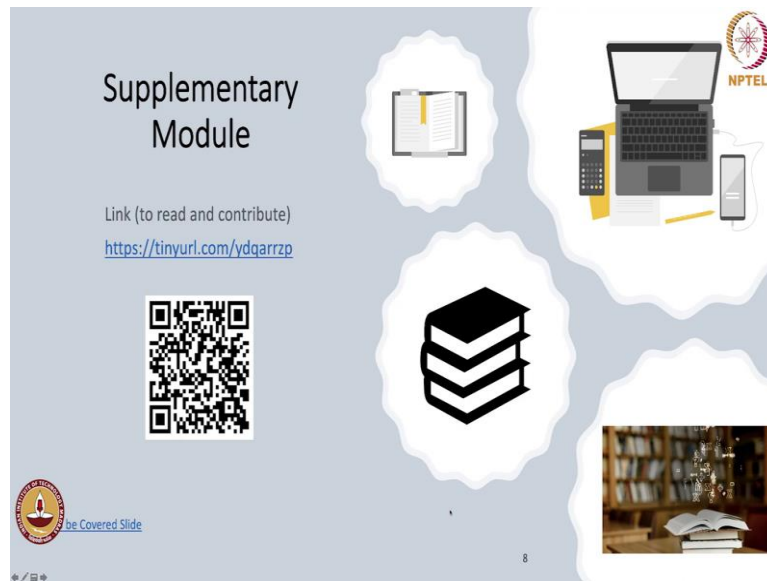
Quiz

1. The number of Modules planned in this NPTEL Lean Construction Series are:
- 4
 - 3
 - 5
 - 2

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Now, when we go into the topics for Lean basics. That is in this module, we will be covering several topics. So, here we have the introduction and the Lean overview session, which will be covered in two sessions. In addition to this introductory session, we have a detailed session on the specific topics we are going to cover and kind of the rationale behind the topics, we then have a session on productivity measurement and improvement.

And this is a standard topic, it has really not much background in Lean, but we choose to cover this because this is the basis for which all measurements are done. And until we, unless we improve productivity on our sites, the implementation of Lean is not apparent.

So, we cover this as a base. It is a foundation on which a metrics and benchmarking can be based and the way it is done on sites today, we will be covering it in more detail and bring in certain concepts which will be required to be able to do the so-called ROI, so called benefits of Lean. So, this forms a base to the course.

We then go on to more topics such as looking at sample and survey techniques, and how would you, we use it to identify waste, we look at value stream and process mapping, again, to be able to look at the flow, look at the value stream, look at construction processes as a flow process and be able to identify the waste and the inefficiencies in these processes.

Then we move on to 5S, which is a very, very important tool in Lean, we go to the collaborative planning system or the last planner which is a very construction specific tool that is been effectively used globally. And we cover the big room approach which has been found to be very, very effective in implementing and bringing about collaboration among the project team. And we also look at the use of IT and BIM and its impact on Lean. And this is

finally followed with the last session on how to practice Lean and use of Lean tools in project sites will be a wrap up session for this module.