

Course Outline

Course Code : DOS4715
Course Title : Lean Principles for Operational Excellence
Class Date : From 16/8/2024 To 15/11/2024
Semester : Semester 1, Academic Year AY24/25
Faculty : Prateek Jain
Department : Analytics & Operations
Email : prateek@nus.edu.sg
URL : <https://evolvewithusnow.com/>
Telephone : +65 92338268

Overview

If you have ever wondered how, you can make a meaningful difference to the effectiveness and efficiency in your organization, then this course is a great place to start. This Lean Six Sigma course aims to equip you with insights, tools and techniques which can be easily deployed to reduce non-value add activities and set SMART goals for business. You will learn proven principles of operational excellence and their association with business situations to become agile through lectures, videos and practical industry insights. The course will focus on the following:

- 1) Fundamentals of Lean Six Sigma and how it can drive sustainable competitive advantage
- 2) How to leverage Lean Six Sigma to create value both in manufacturing and services
- 3) Specifics of Lean Six Sigma transformation and what it takes to successfully build a culture of continuous improvement

Course Objectives

Upon completion of this specialization, learners will have developed an appreciation for Lean and Six Sigma concepts and implementations in business. Embedding these principles into practice will help learners cultivate a mindset of efficiency and effective practices.

The knowledge and skills students will gain include the following (not an exhaustive list):

- Implementation of the Voice of Customer
- Apply Lean and Six Sigma principles and tools
- Use causality in business issues to enable process variability reduction
- Drive quality improvement & defect minimization
- Implement constraint management
- Design and develop business processes to manage risks in business
- Use Efficiency to drive Effectiveness for business results and customer satisfaction

Assessment

Assessment Components	Weightage
(i) Class participation	10%
(ii) Group Assignments (1 Lean, 1 Six Sigma in practice)	20%
(iii) Mid-term Test	30%
(iv) Short Quiz – Six Sigma	10%
(v) Project (20% on Group Report + 10% on Individual Presentation)	30%
Total for CA:	100%

Schedule and Outline

Lesson/ Week	Date	Session (lesson summary or outline / learning objectives / preparation / cases & assignments / follow-up readings & resources)
1	16 Aug	<p>Course Introduction</p> <ul style="list-style-type: none"> - Objectives, expectations, context setting, feedback - Voice of the Customer: Start of the journey - Business fundamentals - Not every dollar spent creates value - Happy employees make happy customers who make happy shareholders <p>The Lean Six Sigma Principles</p>
2	23 Aug	<p>The fundamentals of Lean</p> <p>Lean is a powerful methodology that enables managers and employees to shift their mindset and helps companies to keep their business sustainable by creating competitive advantage. Today, in an increasingly complex and dynamic world, where companies struggle to maintain competitive advantage, Lean is more important than ever.</p> <ul style="list-style-type: none"> - Lean fundamentals - Video lesson - Lean application to different types of companies and contexts - Business context: Manufacturing, Supply Chain, Marketing, Management - How a lean operating model creates competitive advantage <p>The Theory of Constraints – An Optimized Mindset</p>
3	30 Aug	<p>Practical applications of Lean (Physical Goods) – Part 1</p> <ul style="list-style-type: none"> - Theory of Constraints (continued) - Introduction to Lean methods - IPO - Causal Analysis - Value Stream Concept - How to discover the hidden value <p>Simulation Exercise</p>
4	6 Sep	<p>Practical applications of Lean (Physical Goods) – Part 2</p> <ul style="list-style-type: none"> - Visual Workplace - Process Standardization - Concept of Flow and Pull - How to implement Pull Systems <p>How to improve and optimize outputs</p>
5	13 Sep	<p>Practical applications of Lean (Services)</p> <ul style="list-style-type: none"> - How Lean delivers impact in services - Don't fix symptoms, fix root causes - Kaizen: The process of rapid improvement - Optimization of human capital - Importance of digitization with Lean <p>The Flask Factory – Phase I</p>

6	20 Sep	<p>Simulations and Application</p> <ul style="list-style-type: none"> - Understanding the flow - Value of optimization in flow - The Flask Factory – Phase II - Key takeaways from the simulation <p>Mid Term Test</p>
	23 Sep – 29 Sep	Break
7	4 Oct	<p>The Lean Mindset</p> <ul style="list-style-type: none"> - From predicting better to being better prepared - Constraints as resources - Lean empowers creativity through standardization - The PDCA cycle - Video Lesson - The Lean Organization: Top Management to lowest ranks <ul style="list-style-type: none"> • Guest Lecture by an Industry Expert
8	11 Oct	<p>The Fundamentals of Six Sigma</p> <p>Six Sigma is a powerful methodology that assists organizations implement variation reduction in the production and service output to the customers. This improves the competitive edge of the business, ensures quality and repeatable performance over time. Six Sigma delivers consistency and reliability which makes the brands trustworthy in the eyes of the consumers.</p> <ul style="list-style-type: none"> - Six Sigma fundamentals - Looking at Data - Data Charting - The Bell Curve & PPM concept <p>The DMAIC approach</p>
9	18 Oct	<p>Six Sigma - <i>Define and Measure</i></p> <ul style="list-style-type: none"> - Lean Six Sigma Principles - PF/CE/CNX/SOP - Process Capability <p>Measurement System Analysis</p>
10	25 Oct	<p>Six Sigma - <i>Analyze</i></p> <ul style="list-style-type: none"> - Descriptive vs Inferential Statistics - Central Limit Theorem - Confidence Intervals - Hypothesis Testing <p>Introduction to Paper Plane Simulation</p>
11	1 Nov	<p>Six Sigma - <i>Improve and Control</i></p> <ul style="list-style-type: none"> - Improving and sustaining the changes

		<ul style="list-style-type: none"> - Introduction to the tools - Prioritization Matrices - Failure Mode and Effect Analysis - Accelerated Change Methodology <p>Short Six Sigma Quiz</p>
12	8 Nov	<p>Business Opportunities and Risk Management</p> <ul style="list-style-type: none"> - After Action Review - Force Field Analysis - How Lean and Six Sigma work together - Industry examples of Lean Six Sigma process implementation - Second round development - Paper Plane Simulation <p>Group discussions, questions</p>
13	15 Nov	<p>Lean Six Sigma, an approach to holistic Business Management</p> <ul style="list-style-type: none"> - Lean Six Sigma Mindset in business - Evolution of LSS into Green Lean Six Sigma - Group Project Reports and Presentations <p>Conclusion</p>

General Guide & Reading (e.g. Case preparation guide, project report guide, main textbook & supplementary materials, etc)

Suggested Reading:

- Lean Thinking: Banish Waste and Create Wealth in Your Corporation, Daniel T. Jones, James P. Womack, 1996, Taylor & Francis
- Toyota Way, Jeffery Liker, 2003, McGraw-Hill
- Six Sigma Way: How to Maximize the Impact of Your Change and Improvement Efforts, Peter Pande, Robert P. Neuman, and Roland R. Cavanagh, 2014

Academic Honesty & Plagiarism

Academic integrity and honesty is essential for the pursuit and acquisition of knowledge. The University and School expect every student to uphold academic integrity & honesty at all times. Academic dishonesty is any misrepresentation with the intent to deceive, or failure to acknowledge the source, or falsification of information, or inaccuracy of statements, or cheating at examinations/tests, or inappropriate use of resources.

Plagiarism is 'the practice of taking someone else's work or ideas and passing them off as one's own' (The New Oxford Dictionary of English). The University and School will not condone plagiarism. Students should adopt this rule - You have the obligation to make clear to the assessor which is your own work, and which is the work of others. Otherwise, your assessor is entitled to assume that everything being presented for assessment is being presented as entirely your own work. This is a minimum standard. In case of any doubts, you should consult your instructor.

Additional guidance is available at:

- [Administrative Policies](#)

- <http://www.nus.edu.sg/registrar/administrative-policies-procedures/acceptance-record#NUSCodeofStudentConduct>
- <http://nus.edu.sg/osa/resources/code-of-student-conduct>