

Course Outline

Course Code : DOS4715
Course Title : **The Lean Six Sigma Playbook**
Class Date : From 17/1/2025 To 18/4/2025
Semester : Semester 2, Academic Year AY24/25
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Overview

This Lean Six Sigma course aims to equip students with insights, tools and techniques which can be easily deployed to reduce non-value add activities and set SMART goals for business.

In this module, students will learn proven principles of operational excellence, tools and their association with business situations to become agile. The following will be covered:

- Lean Six Sigma as a key driver for sustainable competitive advantage
- How to leverage on Lean Six Sigma to create value both in manufacturing and services
- What it takes to drive Lean transformation and build a culture of continuous improvement

Course Objectives

This course equips students with the expertise to drive change and optimize business processes through Lean Six Sigma methodologies. Students will learn to implement the tools backed by simulations and exercises and real life examples from the industry. This course also prepares them with consulting techniques to identify inefficiencies, implement solutions, and transform operations across industries. The curriculum includes real-world examples, hands-on simulations, and practical applications, providing a comprehensive understanding of process improvement and drive tangible improvements in the organizations and helps them make compelling pitches to clients for enhancing efficiency and effectiveness. A complete playbook to go out and deliver an end-to-end solution for business process improvements in an organization.

Assessment

Assessment Components	Weightage
(i) Tutorial (Class participation)	10%
(ii) Group Assignments:	20%
(iii) Test:	30%
(iv) Project (20% for project contents, 10% for individual presentation)	30%
(v) Others (If applicable, please specify): Individual Home task	10%
Total for CA:	100%
Total for Final Examination:	0%
Total Assessment:	100%

Schedule and Outline

Lesson/ Week	Date	Session (lesson summary or outline / learning objectives / preparation / cases & assignments / follow-up readings & resources)
1	17-Jan-25	Course Introduction <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 The Lean Six Sigma Principles
2	24-Jan-25	The fundamentals of Lean <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 - Quick Wins with Lean - The Theory of Constraints - Business context: Manufacturing, Supply Chain, Marketing, Management How a lean operating model creates competitive advantage
3	31-Jan-25	Practical applications of Lean (Physical Goods) – Part 1 <ul style="list-style-type: none"> - Introduction to Lean methods - How to discover the hidden value - The Lean manufacturing system - IPO - Causal Analysis - Value stream mapping process Simulation Exercise – The practical implementation in industry
4	7-Feb-25	Practical applications of Lean (Physical Goods) – Part 2 <ul style="list-style-type: none"> - Visual Workplace - Process Standardization - Concept of Flow and Pull - How to implement Pull Systems - simulations Real world application - Illustrations from a Nutrition Supply Chain (case study)
5	14-Feb-25	Practical applications of Lean (Services) <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 digitalization with Lean - The Flask Factory – Phase I Learning outcomes & contexts from real world
6	21-Feb-25	Simulations and Application

		<ul style="list-style-type: none"> - Mid Term Test - The Flask Factory – Phase II <p>Learning insights and contexts from real world applications</p>
		Recess Break
7	7-Mar-25	<p>The Real Life Situation</p> <ul style="list-style-type: none"> - The PDCA cycle - The DMAIC approach for Lean Six Sigma <p>Consulting Case Study - Developing a Pitch for Factory Operational Transformation</p> <p>Students are provided with real life masked data from an organization. They gain an overview of the client issues and continue to learn more tools in the subsequent classes, correlating to the case study for their application.</p> <p>The client is facing challenges in efficiency, quality, and employee engagement, and seeks expert advice on implementing Lean Six Sigma principles to optimize their processes.</p> <ul style="list-style-type: none"> - Understanding the Client's Challenges - Strategic Analysis and Lean Application to data provided - Solution Development: DMAIC Application - Proposing an Action Plan for improvement - Building the Consulting Pitch <p>Application of above approaches to the client's challenges in groups.</p>
8	14-Mar-25	<p>The Six Sigma Approach</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 - Data Charting - Making sense out of data - The Bell Curve & PPM concept - Control Charts - Money matters and how businesses get impacted <p>Transformation in the industry with Six Sigma (real world case studies)</p>
9	21-Mar-25	<p>Six Sigma Tools for <i>Define and Measure</i></p> <ul style="list-style-type: none"> - Six Sigma Toolkit – quick references to problem solving tools - SIPOC - Cause & Effect Diagrams - Decision Tree - PF/CE/CNX/SOP - Process Capability

		<ul style="list-style-type: none"> - Table Exerciss on masked data <p>Measurement System Analysis</p>
10	28-Mar-25	<p>Six Sigma Tools for <i>Analyze</i></p> <ul style="list-style-type: none"> - The statistical toolkit to analyze problems - Descriptive vs Inferential Statistics - Central Limit Theorem - Confidence Intervals - Hypothesis Testing - Table Exercises on masked data - Introduction to Paper Plane Simulation 1 <p>Learning insights and context from real world</p>
11	4-Apr-25	<p>Six Sigma Tools for <i>Improve and Control</i></p> <ul style="list-style-type: none"> - Toolkit to embed changes and deliver improvements to processes - Improving and sustaining the changes - Prioritization Matrices - Force Field Analysis - Failure Mode and Effect Analysis - Accelerated Change Methodology: driving organizational change <p>Short Six Sigma Quiz</p>
12	11-Apr-25	<p>Business Opportunities and Risk Management</p> <ul style="list-style-type: none"> - Evolution of LSS into Green Lean Six Sigma - Constraints as resources - After Action Review - The Lean Organization: Top Management to lowest ranks - Second round development - Paper Plane Simulation 2 <p>Key insights from simulation on product development and real world context</p>
13	18-Apr-25	<p>Final Pitch Presentations - Winning the Project</p> <ul style="list-style-type: none"> - Pitch to client with understanding of their issues, analysis of problems, Hypothesis validation, Solution proposals, Methodology - Demonstrate application of tools learned throughout the course - Learners not just present findings but detailed implementation plans <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>