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المعهد الهندسي لخدمات التكنولوجيا والبرمجيات



Engineering office for Technology and Software Services

Lean Manufacturing & Six Sigma



Course Code: 2046-MECH/NC

Main Branch: United building – E Shams –Front NBE
, El Siouf _Alexandria

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Introduction

This course offers a powerful combination of **Lean Manufacturing** and **Six Sigma** principles to streamline production processes, reduce waste, and enhance quality through data-driven decision making. It is ideal for engineers and managers involved in manufacturing and continuous improvement.

Description

Participants will learn to identify waste, improve efficiency, and apply Six Sigma tools to analyze and enhance processes. The course is structured around the **DMAIC framework** (Define, Measure, Analyze, Improve, Control) and includes hands-on practice with Lean tools such as **5S, Kaizen, Value Stream Mapping**, and Six Sigma techniques like **Ishikawa diagrams** and **Pareto analysis**.

Course Objectives

By the end of this course, participants will be able to:

- Understand and implement Lean principles to minimize waste
- Apply Six Sigma methodology for process improvement
- Use DMAIC tools to analyze and solve quality issues
- Lead improvement projects in production and service industries

Course Duration

- **Duration:** 5 Weeks
- **Sessions:** 15 (3 sessions/week)
- **Each Session:** 2 hours
- **Total Hours:** 30 Hours

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Course Content Overview

Week 1: Lean Manufacturing Principles

- Introduction to Lean Thinking
- The 5S Methodology for workplace organization
- Kaizen (Continuous Improvement)
- Value Stream Mapping (VSM) for process visualization

Week 2: Process Analysis Tools

- Ishikawa (Fishbone) Diagrams
- Pareto Charts
- Process Flow Diagrams
- Identifying root causes and bottlenecks

Week 3: Six Sigma – Define Phase

- Project selection and scoping
- Creating project charters
- Voice of the Customer (VoC) and CTQ (Critical to Quality)

Week 4: Six Sigma – Measure & Analyze Phases

- Data collection and measurement systems
- Process capability analysis
- Identifying variation and root cause analysis

Week 5: Six Sigma – Improve & Control Phases

- Generating and testing improvement ideas

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- Implementing control plans
- Monitoring and sustaining gains

Hands-on Projects

- **Project 1:** Apply Lean tools to improve an existing production process
- **Project 2:** Implement a full Six Sigma project using the DMAIC cycle to improve a real or simulated quality issue

Target Audience

- Production Engineers
- Quality Engineers and Managers
- Process Improvement and Operations Managers
- Industrial Engineering Students and Practitioners

Tools & Techniques

- DMAIC Framework
- Lean Tools (5S, Kaizen, VSM)
- Six Sigma Analysis Tools (Fishbone, Pareto, Control Charts)
- Excel / Minitab for statistical analysis

Learning Outcomes

Participants will gain:

- Ability to lead Lean improvement and Six Sigma projects

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- Analytical skills to identify and reduce waste and variation
- Practical knowledge of Lean/Six Sigma tools
- Strong foundation in continuous improvement methodologies

Certification

A **Certificate of Completion** will be awarded upon successful participation and completion of improvement projects.

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