



# Lean Six Sigma Green Belt - EngineRoom

## Course Map

Total Estimated Hours: 83.8

### SESSION 1: Introduction to Lean Six Sigma

4.35 HOURS

- Introduction
- Higher Standards for Higher Performance
- Input Determines Output
- Lean Six Sigma Defined
- What's In a Name?
- The 5 Lean Principles
- The 8 Forms of Waste
- Success Stories
- The Sigma Level
- The 99.9% Problem
- DNA of a Champion
- Lean Six Sigma Framework
- DMAIC - The Improvement Process
- Lean and DMAIC
- Thought Process Mapping - Toolset
- Organizing for Success
- Working Relationships
- Introduction to EngineRoom®
- Skill Check

### SESSION 2: Define I - Starting a Project and Leading Teams

6.95 HOURS

- Getting Started - Project Initiation
- Project Selection Toolset
- Project Charter Toolset
- Project Planning & Tracking Toolset
- Leadership Thinking
- Robot Leadership
- Fueling The Improvement Engine
- Leading Teams
- Developing an Effective Team
- Improving Team Development
- 4 Conversations Toolset
- Leading Change
- Leading Change - Continued
- Success Factors For Effective Change Management
- Leader Standard Work Toolset
- Stakeholder Analysis - RACI Matrix
- Leadership Reflection
- Exercises and Quiz

### SESSION 3: Define II - Voice of the Customer

6.5 HOURS

- Voice Of The Customer
- Focus on The Customer
- Understanding Customer Requirements
- Where to Go For Customer Requirements
- Conducting Surveys
- Survey Considerations
- Surveys - Sampling Frame
- Structuring Survey Questions
- The Degree of Uncertainty in Sampling
- Guideline for Margin of Error
- Affinity Diagram Toolset
- CTQC Tree Diagram Toolset
- Operational Definition Toolset
- Voice Of The Customer As Specifications
- Exercises and Quiz



#### **SESSION 4: Define III - Mapping the Process**

**5.4 HOURS**

- Drawing a Process Picture
- Process Thinking
- The Source of Value
- The Source of Value: Gemba
- Process Mapping - Overview
- Process Mapping (SIPOC) Toolset
- Flow Charts
- Value-Added Flow Charts
- Spaghetti Charts
- Takt Time
- Value Stream Mapping Toolset
- Define Tollgate - Progress Review
- Exercises and Quiz

#### **SESSION 5: Measure I - Measurements and Basic Statistics**

**6 HOURS**

- Measurements and Basic Statistics
- Business Problem Solving
- Basic Statistical Terms
- Descriptive and Inferential Statistics
- Measurements
- Discrete vs. Continuous Measurements
- Measurement Subjects
- Graphical Summaries
- Pareto Chart Toolset
- Histogram Toolset
- Understanding Variation
- Measuring Central Tendency
- Quantifying Process Variability
- The Normal Distribution
- Exercises and Quiz

#### **SESSION 6: Measure II - Measurement System Analysis**

**8.55 HOURS**

- Measurement System Analysis - Introduction
- Measurement as a Process
- Cause & Effect Matrix Toolset
- The Analysis of Measurement Systems
- The Requirements of Measurement Systems
- Variable MSA - Gauge R & R
- Attribute Measurement System Analysis
- Calibration of Measurement Systems
- Collecting Data
- Developing a Sampling Plan
- Baseline Performance
- Derivative Performance Metrics - Throughput Yield
- Derivative Performance Metrics - Rolled Throughput Yield
- Calculating the Sigma Level - Toolset
- Exercises and Quiz

#### **SESSION 7: Measure III - Charting Process Behavior**

**10.25 HOURS**

- Introduction - Charting Process Behavior
- Trend Chart (Run Chart) Toolset
- SPC - Introduction and Background
- SPC - Introduction to Control Charts
- SPC - Control Chart Limits
- SPC - More On Control Limits
- Implementing SPC
- SPC Chart Selection
- Rational Subgrouping Toolset
- X and Moving Range Charts - Toolset
- Transformation for Control Charts
- Attribute Control Chart Toolset
- X-bar and R Chart Toolset
- SPC Using Stage Variables
- Control Chart Case Study
- Process Capability Toolset
- Measure Tollgate - Progress Review
- Exercises and Quiz

## **SESSION 8: Analyze I - Identifying Potential Root Causes**

**7.4 HOURS**

- ANALYZE I - Introduction
- Finding The Root Cause
- Cause & Effect Diagram Toolset
- 5-Why, 1-How
- A Combination of 5-Why, Pareto, and Trend Charts
- Box Plots Toolset
- Scatter Plot Toolset
- Correlation and Regression Analysis
- Multiple Regression Toolset
- Factors In Determining Sample Size
- Estimating Population Mean
- Exercises and Quiz

## **SESSION 9: Analyze II - Hypothesis Testing**

**10.9 HOURS**

- ANALYZE II - Introduction
- Introduction to Hypothesis Testing
- The Process On Trial
- The Hypothesis - Accept or Reject?
- Types of Error
- Hypothesis Testing
- Confidence Intervals
- Treatment Comparisons - Control Charts
- Comparing Two Proportions Toolset
- Comparing Two Means - t-Test Toolset
- Comparing Multiple Means - ANOVA Toolset
- Hypothesis Testing Learning Lab
- Analyze Tollgate - Progress Review
- Exercises and Quiz

## **SESSION 10: Improve**

**11.85 HOURS**

- Improve
- Design for Lean Six Sigma (DFSS)
- Benchmarking
- Brainstorming
- Narrowing Down The List of Ideas
- FMEA Toolset
- Error-proofing
- Prioritizing and Selecting a Solution
- The A3 One-Page Report
- Continuous Flow Toolset
- Leveling Production (Heijunka)
- Quick Changeover Toolset
- Cellular Processing Toolset
- Pull System Overview
- Pull Scheduling
- Core Process Pull Toolset
- Kaizen Toolset
- Corrective Action Matrix
- Piloting a Solution
- System Dynamics Toolset
- Improve Tollgate - Progress Review
- Exercises and Quiz

## **SESSION 11: Control**

**5.65 HOURS**

- Control
- Control Charts Revisited
- The Process Control Plan
- More On FMEA
- Visual Management
- 5-S Approach
- Total Productive Maintenance
- TPM Objectives & Benefits
- TPM Metrics
- Best Practices and Lessons Learned
- Standardized Work - Documenting Process Changes
- Ending the Project
- Control Tollgate - Progress Review
- Exercises and Quiz
- Course Completion

- The Lean Six Sigma Journey