

# COURSE AGENDA

## INTRODUCTION TO LEAN SIX SIGMA

- 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 Lean Six Sigma Improvement Process
- Lean and DMAIC
- Thought Process Mapping
- Toolset
- Organizing for Success
- Working Relationships
- Critical Success Factors
- Introduction to EngineRoom®
- Exercises and Quiz

## STARTING A PROJECT AND LEADING TEAMS

- Getting Started -Project Initiation
- Balanced Scorecard Toolset
- Project Selection Toolset
- Project Charter Toolset
- Project Planning & Tracking Toolset
- Leadership Thinking
- Robot Leadership
- Fueling The Improvement Engine
- Leadership Characteristics
- Practice, Study and Reflection
- Learning by Modeling
- Leading Teams
- Developing an Effective Team
- Improving Team Development

- 4 Conversations Toolset
- Leading Change
- Leading Change
- Continued
- Success Factors For Effective Change Management
- Stakeholder Analysis
- RACI Matrix
- Leadership Reflection
- Exercises and Quiz

## Define II -Voice of the Customer

- 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
- QFD Toolset
- Exercises and Quiz

## Define III -Mapping the Process

- Drawing a Process Picture
- Process Thinking
- The Source of Value
- Value Stream Leverage
- 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

## MEASURE I -MEASUREMENTS AND BASIC STATISTICS

- 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

## MEASURE II -MEASUREMENT SYSTEM ANALYSIS

- 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
- MSA - Graphing
- 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

## MEASURE III -CHARTING PROCESS BEHAVIOR

- Introduction -Charting Process Behavior
- Trend 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
- Attribute Control Chart Toolset
- X- bar and R Chart Toolset
- Process Capability Toolset
- The Sigma Level Revisited
- Measure Tollgate
  - Progress Review
- Exercises and Quiz

## ANALYZE I - IDENTIFYING POTENTIAL ROOT CAUSES

- ANALYZE I -Introduction
  - Finding The Root Cause
  - Cause & Effect Diagram Toolset
  - Alternative To The Cause & Effect Diagram
  - 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
- Logistic Regression Toolset
- Factors In Determining Sample Size
- Estimating Population Mean
- Exercises and Quiz

## ANALYZE II -HYPOTHESIS TESTING

- ANALYZE II - Introduction
- Introduction to Hypothesis Testing
- The Process On Trial
- The Hypothesis - Accept or Reject?
- Types of Error
- Power Analysis
- Power Analysis - Factors
- Hypothesis Testing
- Confidence Intervals
- Treatment Comparisons - Control Charts
- Comparing One Proportion to a Standard
- Comparing Two Proportions - Z-test Toolset
- Comparing Multiple Proportions - Chi-Square
- Comparing One Mean to a Standard -t-test
- Comparing Two Means - t-test Toolset
- Comparing Multiple Means -ANOVA/F - test Toolset
- Confidence Intervals - Least Significant Difference
- Comparing One Variance to a Std. - Chi-Square
- Comparing Two Variances -F-test Toolset
- Parametric vs. Non Parametric Tests Non Parametric Toolset
- Hypothesis Testing Learning Lab
- Exercises and Quiz

## ANALYZE III - DESIGN OF EXPERIMENTS

- Design of Experiments -Introduction
- Design of Experiments -History
- Design of Experiments -Components
- Design of Experiments - Principles
- Design of Experiments - Purpose

- Design of Experiments -Process
- Design of Experiments -Guidelines
- Selecting the Right Design
- Blocking
- Blocking and Tackling
- Faster Deliveries Through Experimentation
- Beyond One -Factor Experiments
- Two Level Full Factorial Toolset
- Two Level Fractional Factorial Toolset
- General Factorial Toolset
- DOE Power and Sample Size
- Designing An Experiment To Save The Kingdom
- Better Pizza Through Design of Experiments
- Designing Experiments to Sell More Coffee
- Additional Subjects
- Analyze Tollgate -Progress Review
- Design of Experiments Exercises and Quiz

## IMPROVE

- 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
- Quick Changeover Toolset
- Cellular Processing Toolset
- Balancing Capacity with Demand

- The Theory of Constraints (TOC) Toolset
- Pull System Overview
- Pull Scheduling
- Pull Systems
- Core Process Pull Toolset
- Kaizen Toolset
- Corrective Action Matrix
- Piloting a Solution
- System Dynamics Toolset
- Improve Tollgate - Progress Review
- Exercises and Quiz

### Control

- Control
- Control Charts Revisited
- The Process Control Plan
- More On FMEA
- Visual Control
- 5-S Approach
- CHECK Process
- Total Productive Maintenance
- TPM Objectives & Benefits
- TPM Metrics
- TPM Core Elements
- TPM Maintenance Activities
- 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