



Lean Six Sigma Black Belt

Training Program Brochure

Program Introduction

In its purest form, Lean Six Sigma is about leveraging the principles and tools of science to abate business risk – at all levels of an enterprise. With this in mind, we can view the practice of Lean Six Sigma (LSS) from four different altitudes. At its highest level, LSS is a strategic vision that epitomizes business success. Second, it is a tactical system of project management that optimizes the control function of a commercial or industrial enterprise.

Third, it's a scientific approach for minimizing or eliminating certain forms of business risk commonly associated with the operation of critical processes. Fourth, it is a personal way of thinking that unites the power of deductive reasoning with the benefits commonly associated with data-driven decision making.

Program Rationale

Today, more than ever before, organizations of all types are questing for top and bottom line improvement. This journey is no longer considered a side-bar activity; rather, it is now viewed as a critical business imperative. Of course, this means that business executives must find new and innovative ways to reduce their total cost structure, improve capability and increase capacity, but done so without capital investment. These executives also understand that, to achieve this mission, they must improve their core processes, yet done so in an economical, repeatable and verifiable way. Naturally, the realization of this grand vision requires individuals that have the capability to yield beneficial change in a relatively short period of time. When leaders of this calibre are enabled by the power of Lean Six Sigma, quantum business improvements are not only possible, but highly probable.

Program Description

The SSMI® Lean Six Sigma Black Belt Training Program is intended to develop technical leaders that are capable of propelling their respective organizations toward best-in-class status by reducing costs, improving cycle times, eliminating defects, eliminating variation and significantly increasing customer satisfaction.

Black Belts are highly trained practitioners who possess the technical knowledge and skills that are necessary to lead breakthrough improvements in key processes that support the overall business aims and operational goals of an enterprise. In summary, Black Belts are individual contributors or front line managers that:

- *Serve as change agents, internal consultants, mentor to Green Belts and assistant Six Sigma Champions.*
- *Optimize existing technology, or bring new technologies on line at optimal operating conditions.*
- *Practice the art and science of solving process-centric problems through the analysis of performance data.*
- *Implement technical and leadership capability to improve the performance of industrial or commercial process, regardless of complexity or output volume.*
- *Solve specific process-oriented or design-centric problems that have a negative impact on customer satisfaction, operational capability, output capacity, cycle time and other performance-related metrics.*



Target Audience

This program of study has been designed for individual contributors and managers seeking vertical mobility or pursuing horizontal opportunities within their respective fields of practice. The successful candidate enjoys working with data and solving problems, as well as working in a project-based, team-oriented environment. Basic arithmetic and computer skills are essential. In this context, a rudimentary understanding of Excel is highly recommended, but not essential. Furthermore, a most rudimentary understanding of algebra is a plus, but not required. Generally speaking, the successful completion of any undergraduate degree program will likely support the academic demands of this program.

Program Goals

Upon completion of this program of study, the candidate will be able to successfully:

- *Master the Six Sigma DMAIC methodology and the related set of analytical tools.*
- *Apply the Lean Six Sigma knowledge and skills to successfully lead project teams.*
- *Implement the DMAIC methodology and tools to accomplish Black Belt level projects.*
- *Utilize the principles and practices of Lean Six Sigma to better frame and solve daily problems.*
- *Improve business value for the customer and provider in a concurrent and synergistic way.*

Program Focus

The SSMI® Lean Six Sigma Black Belt program of study will focus on several key areas:

- *Six Sigma principles, practices, deployment strategies and implementation tactics.*
- *Lean principles, leadership and change management.*
- *Descriptive statistics, benchmarking methods, process control techniques, process diagnostic methods and experimental design methods.*
- *Types and uses of performance data, sample size determination and sampling schemes.*
- *Project selection criteria, charter elements, execution milestones and review guidelines.*
- *Principles and practices associated with process characterization and optimization.*



Who is the Six Sigma Management Institute

The Six Sigma Management Institute was founded by Dr. Mikel J. Harry, the co-creator of the Six Sigma methodology. For over 20 years, we have coached hundreds of companies and trained thousands of individuals both with goal of helping them achieve the highest level of performance in their industries and professional careers. During these highly complex and data-driven times, we believe than every individual should be knowledgeable of the frameworks and the tools required to dive deep into data and re-emerge with valuable information, to help their company and themselves achieve breakthrough improvements. SSMI's mission is to provide the necessary frameworks and tools to enable any company enhancing the quality of their products, services and ultimately to increase the satisfaction of their clients.

Program Architect

Dr. Harry has been widely recognized as one of the original architects and pioneer of Six Sigma inside Motorola at which he was responsible for the research and development of advanced engineering and statistical models. All the training offered by SSMI are the result of 30 years of application of these models. Even though many companies worldwide now offer Lean and Six Sigma trainings, SSMI is the only Institute in the world to possess the original material and framework which made this methodology one of the most successful and powerful in the world.



Certification Path

In order to obtain an SSMI® Lean Six Sigma Black Belt Certification each and every candidate must complete the following steps:



Online Self – Paced or Class Training

The total instructional time for the SSMI® Lean Six Sigma Black Belt Training is 20 days (classroom) or 160 hours (online). Of course, for the online format participants can take the time they need and set their own schedule.

Knowledge Assessment Exams

Completion of 21 Knowledge Assessments Exams. Each module assessment comprises of 12 to 102 questions which participants need to score more than 70%

Digital Training Project

Completion of Digital Training Project. The assessment comprises of 232 questions and the pass mark is 70%

SSMI International Certification

Upon the completion of every requirement the candidate will receive the certificate for the SSMI® Lean Six Sigma Black Belt Training Program.



Program Modules

The body of knowledge associated with this program of study is organized into three primary segments: Global Concepts, General Practices and Technical Practices. In terms of structure, all program segments are comprised of core topics. The segments and topics for the Black Belt Training are as follows:

Training Orientation

- Excel Orientation
- Statistical Software Orientation
- Simulator Orientation

1. Breakthrough Vision

- Content Overview
- Driving Need
- Customer Focus
- Core Beliefs
- Deterministic Reasoning
- Leverage Principle
- Tool Selection
- Performance Breakthrough

2. Business Principles

- Quality Definition
- Value Proposition
- Metrics Reporting
- BOPI Goals
- Underpinning Economics
- Third Generation
- Success Factors

3. Process Management

- Performance Yield
- Hidden Processes
- Measurement Power
- Establishing Baselines
- Performance Benchmarks
- Defect Opportunity
- Process Models
- Process Capability
- Design Complexity
- Product Reliability

4. Installation Guidelines

- Deployment Planning
- Deployment Timeline
- CXO Role
- Champion Role
- Black Belt Role
- Green Belt Role
- White Belt Role
- Application Projects
- DFSS Principles
- PFSS Principles
- MFSS Principles

5. Application Projects

- Project Description
- Project Overview
- Project Guidelines
- Project Scope
- Project Leadership
- Project Teams
- Project Financials
- Project Management
- Project Payback
- Project Milestones
- Project Charters

6. Value Focus

- Value Creation
- Recognize Needs
- Define Opportunities
- Measure Conditions
- Analyze Forces
- Improve Settings
- Control Variations
- Standardize Factors
- Integrate Lessons
- Application Example

7. Lean Practices

- Lean Thinking
- Constraint Theory
- Continuous Flow
- Pull Systems
- Visual Factory
- Kanban System
- PokaYoke System
- 6S System
- SMED System
- 7W Approach
- Kaizen
- Value Stream Mapping
- 6M Approach
- A3
- Overview of Flow
- Hiejunka
- TPM
- Jidoka
- Lean Wrap - Up

8. Quality Tools

- Variable Classifications

- Measurement Scales
- Problem Definition
- Focused Brainstorming
- Process Mapping
- SIPOC Diagram
- Force - Field Analysis
- Matrix Analysis
- C&E Analysis
- Failure Mode Analysis
- Performance Sampling
- Check Sheets
- Analytical Charts
- Pareto Charts
- Run Charts
- Multi - Vari Charts
- Correlation Charts
- Frequency Tables
- Performance Histograms
- Basic Probability
- Pre - Control Charts
- Control Charts
- Score Cards
- Search Patterns
- Concept Integration
- Quality Simulation

9. Basic Statistics

- Performance Variables
- Statistical Notation
- Performance Variation
- Normal Distribution
- Distribution Analysis
- Location Indices
- Dispersion Indices
- Quadratic Deviations
- Variation Coefficient
- Deviation Freedom
- Standard Transform
- Standard Z - Probability
- Central Limit
- Standard Error
- Student's Distribution
- Standard T - Probability
- Statistics Simulation

10. Continuous Capability

- Performance Specifications
- Rational Subgrouping
- Capability Study



- Instantaneous Capability
- Longitudinal Capability
- Cp Index
- Cpk Index
- Pp Index
- Ppk Index
- Process Shifting
- Process Qualification
- ConcaP Simulation

11. Discrete Capability

- Defect Metrics
- Defect Opportunities
- Binomial Distribution
- Poisson Distribution
- Throughput Yield
- Rolled Yield
- Metrics Conversion
- DiscaP Simulation

12. Hypothesis Testing

- Statistical Inferences
- Statistical Questions
- Statistical Problems
- Null Hypotheses
- Alternate Hypotheses
- Statistical Significance
- Alpha Risk
- Beta Risk
- Criterion Differences
- Decision Scenarios
- Sample Size

13. Confidence Intervals

- Mean Distribution
- Mean Interval
- Variance Distribution
- Variance Interval
- Proportion Distribution
- Proportion Interval
- Frequency Interval

14. Control Methods

- Statistical Control
- Control Logic
- Control Limits
- Chart Selection
- Chart Interpretation
- Zone Testing
- Variables Chart
- Attribute Chart
- Individuals Chart
- IMR Chart
- Xbar Chart
- Range Chart
- Proportion Chart
- Defect Chart
- Other Charts

- Capability Studies
- Control Simulation

15. Parametric Methods

- Mean Differences
- Variance Differences
- Variation Total
- Variation Within
- Variation Between
- Variation Analysis
- One - Way Anova
- Two - Way Anova
- N - Way Anova
- ANOVA Graphs
- Linear Regression
- Multiple Regression
- Residual Analysis
- Parametric Simulation

16. Chi - Square Methods

- Statistical Definition
- Model Fitting
- Testing Independence
- Contingency Coefficients
- Yates Correction
- Testing Proportions

17. Survey Methods

- Research Design
- Information Sources
- Questionnaire Construction
- Formulating Questions
- Question Quality
- Sampling Plans
- Data Analysis

18. Nonparametric Methods

- Nonparametric Concepts
- Median Test
- Runs Test
- Other Tests

19. Experimental Methods

- Design Principles
- Design Models
- Experimental Strategies
- Experimental Effects
- One - Factor Two Level
- One - Factor Multi Level
- Full Factorials
- Two - Factor Two Level
- Two - Factor Multi Level
- Three - Factor Two Level
- Planning Experiments
- Fractional Factorials
- Four - Factor Two Level
- Five - Factor Two Level

- Screening Designs
- Robust Designs
- Experiment Simulation

20. DFSS Methods

- QFD Method
- Capability Flow
- Capability Flow
- Tolerance Analysis
- Monte - Carlo Simulation

21. Measurement Analysis

- Measurement Uncertainty
- Measurement Components
- Measurement Studies

Digital Training Project

- Recognize Phase
- Risk Analysis
- Project Introduction
- Define Phase
- Measure Phase
- Analyze Phase
- Improve Phase
- Control Phase
- Survey Analysis



Benefits of an SSMI® Lean Six Sigma Certification



Better Execution

Six Sigma links strategic initiatives to operational improvements to create efficiencies for your business.



Build Customer loyalty

Six Sigma helps to target your customer needs so you can improve the things that matter most to your customers.



Create Greater Returns

Six Sigma helps to lower the operational costs and reduce the turnaround time in delivery of products and services to bring about higher customer satisfaction.



Certifies your Talent

A Lean Six Sigma Certification is the proof that you have the experience and skills to deliver quality service that matches customer expectations.



Improves your work performance

Professionals with Lean Six Sigma skills earn close to \$120,000 with global opportunities.



Opens Doors

A Lean Six Sigma credential can get you access to globally renowned companies of your choice.



Applies Everywhere

Six Sigma Certifications are based on achieving excellence while providing quality services. The concepts and techniques can be adapted to any real-world challenge across industries, market segments and geographies.

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