



Lean Six Sigma Black Belt Training Program

Onsite – 120 Hours – Optimum class size 6-10 students

Overview

The Lean Six Sigma Black Belt Training Program combines the proven methods of Lean with the power of Six Sigma to allow you to solve difficult problems within your business. The curriculum is based on the approach pioneered by Motorola and utilized by successful companies of all sizes.

This training will introduce the participants to the structured data driven problem solving methodology known as DMAIC (Define, Measure, Analyze, Improve, Control). This methodology in concert with the Lean Six Sigma business improvement strategy seeks to identify, reduce and eliminate defects from products, processes and business transactions.

Participants will learn critical thinking skills, how to reduce variation and non-value-added activities, gain leadership skills and focus on the voice of the customer. All while reducing defect rates, cost and cycle time. Participants will utilize the DMAIC model and will learn statistical methods and software (Minitab) to analyze company data and make process improvements.

You do not need to be a statistician or math wizard to attend. Statistics are presented with the “keep it simple statistically” approach so participants can master the skills. A combination of presentation and hands-on exercises and simulations are used throughout to ensure a practical working knowledge of the methods. Participants who take this class, successfully complete an application project and pass the Lean Six Sigma certification exam will be certified as a LSS Black Belt.

Training Objective

The objective of this training will be to have each participant complete at least one management approved project within their organization which will eliminate waste, improve cycle time and/or improve quality. Projects will address specific quality, productivity and process issues using a data driven approach to minimize or reduce process variation. Each student will be required to complete and document a Black Belt project illustrating the business and quality impact of their work for certification. Students will use a Statistical Software package in class (Minitab) to solve statistical analysis problems.



Skill Attainment:

Lean Six Sigma Black Belt Training – Participants will learn how to apply the crucial observational, analytic and interpersonal skills of a successful Lean Six Sigma Black Belt. These skills include:

- Introduction and Fundamentals of Lean Six Sigma - DMAIC
- Introduction to Minitab Statistical Software
- Introduction to Statistics
- Selection and Chartering a Project
- Team Dynamics and Facilitation,
- Defining Customer Requirements (VOC) and Baselining Current Process
- Developing effective measurements
- Analyzing and improving the process
- Variation Reduction and Error proofing techniques
- Workload Balancing, Flow and Pull techniques
- Statistical analysis techniques for analyzing both variable and attribute data
- Simple and Multiple Regression Techniques
- Normal Distribution other distributions
- Process Capability - Cp, Cpk, Ppk
- Statistical Process Control Concepts,
- Design of Experiments techniques
- Team Problem Solving skills,
- Standard Work and Project Documentation
- Quality Function Deployment
- Control Plans
- Skills will be used to initiate and complete projects using statistical data to determine, implement, and sustain improvement solutions

Black Belt Training Schedule (15 Days Total):

- 4-hour Program Structure and Project Selection Training Workshop. Topics include:
 - Lean Six Sigma Overview
 - Project Chartering
 - Organizing for Success
 - Candidate Selection
 - Linking Strategy to Results
 - Tollgate/Phase Reviews
 - The Role of the Project Sponsor
 - Communication and Change Acceleration



- 4-hour Black Belt Candidate and Project Sponsor Training Workshop.
- Topics include:
 - Green Belt and Project Sponsor Roles
 - Project Management
 - Project Charters
 - Tollgate/Phase Reviews
 - Introduction to Minitab
 - Certification Requirements
- 112 hours of classroom and hands-on learning activities, exercises, demonstrations, testing and project presentations utilizing Minitab software and Catapults. The following topics are taught and practiced during the training:

DEFINE

- Lean Six Sigma Overview & Methodology
- Voice of the Customer (VOC)
- Supplier-Inputs-Process-Output -Customer (SIPOC)
- Process Mapping
- Value Stream Mapping
- Observation Analysis
- Project Management Leadership Skills
- Multi-Generational Project Planning
- Quality Function Deployment

MEASURE

- Introduction to Descriptive Statistics
- Measurement and Data Collection
- Measurement Systems Analysis & Gage R&R
- Measurement Systems for Attribute Data
- Baselining Techniques – 5S, Overall Equipment Effectiveness

ANALYZE

- Normal Distribution and other Distributions
- Attribute versus Variable Data
- Process Capability for Variable Data
- Process Capability for Attribute Data
- Graphical Techniques
- Statistical Process Control
- Cause & Effect and FMEA risk assessment
- Inferential Statistics
- Confidence Intervals
- Introduction to Hypothesis Testing



- Hypothesis Tests: Z and t Tests
- ANOVA and ANOM
- Hypothesis Test: Proportion Tests
- Chi-Square Tests
- Power & Sample Size
- Hypothesis Test for Non-Normal Data

IMPROVE

- Kaizen
- Changeover Reduction
- TPM/Autonomous Maintenance Techniques
- Process Flow Improvements

STANDARD WORK

- Line Balancing and Cellular Flow
- Types of Pull Systems
- Introduction to Process Regression Analysis
- Simple and Multiple Regression
- Queuing Theory
- Introduction to Design of Experiments
- Full Factorial Experiments
- Fractional Factorial Experiments
- Blocking and Robustness
- Taguchi Loss Function
- Solution Generation and Selection

CONTROL

- Control Plans
- Statistical Process Control Charts – Variable & Attribute
- Visual Controls
- Error proofing
- Communication and Change Acceleration
- Sales and Operations Planning
- Design for Lean Six Sigma
- DMEDI and DMADV

LSS Black Belt Training Overview and Expectations

- 15 days of Interactive Classroom instruction with instructor lead support
- The sessions will be held over a four-to-six-month period and include Classroom Learning, Exercises, Activities, Demonstrations, On-the-Job practical Application, Homework and Tests.
- Within six months after training initiation the participants are expected to complete at least one successful project approved by top management.



- Skill requirements
 - Basic Algebra
 - Basic Computer Skills – spreadsheets, word processing, email
 - Access to a computer/laptop both in and out of class
 - Access to Minitab software (company to provide)
- 100% attendance for all classes is required

Expectations from Management

- Will select and approve participant application projects
- Will allow time for project completion in between classes
- Will serve as champions and sponsors for their participants when they need support and resources

- Will attend ending project presentations at a minimum.

What the students can expect

- Clear and intuitive classes focused on making Lean Six Sigma simple and fun
- Workshops and practical application sessions – work as a team on exercises including DOE live experiments
- Learn how to manage Lean Six Sigma projects to get results
- One-on-One help as needed in between classes
- Finish a project successfully with a clearly identified and verifiable financial impact
- Have fun!