LEAN SIX SIGMA BLACK BELT CERTIFICATION TRAINING

Gain a thorough understanding of all aspects of the Lean Six Sigma Method including a high-level of competence in the subject matters contained within the phases of Define, Measure, Analyze, Improve and Control (DMAIC) as defined by the IASSC Lean Six Sigma Black Belt Body of Knowledge™.

Benefits of LSSBB Certification

- Get well versed in the core to advanced elements of Lean Six Sigma Methodology
- Understand how to implement, perform, interpret, and apply Lean Six Sigma at an advanced level of proficiency
- Lead complex improvement projects
- Gain a thorough understanding of all aspects of the Lean Six Sigma Method
- Advance your career, increase your employability, and enhance your earning potential

Key Features

- Lean Six Sigma Black Belt (LSSBB) Classroom Certification Training
- 2 Full Length Lean Six Sigma Black Belt Practice Tests
- Certified Lean Six Sigma Black Belt Exam Fee Included
- 6 Months Complimentary Access to LSSBB E-Learning
- Instructor-led Classroom Training Workshop by an Expert Trainer
- Instructor-led Live Online Training also available

Modes of Engagement

Instructor-Led Classroom Training
4-Day LSSBB Certification exam prep classroom training workshops conducted worldwide.

Instructor-Led Live Online Training
Provided to your company's employees across global locations through Citrix GoToMeeting or Cisco WebEx.

Self-Paced E-Learning
Anywhere, anytime access to E-Learning through a Learning Management System for employees across the globe.

Enterprise Training
In-House certified instructor-led 4-day LSSBB certification training in your office across global locations.

LSSBB Course Agenda

1. OVERVIEW
- What is Six Sigma
- Six Sigma Roles and Responsibilities
- About LSSBB
- LSSBB Roles and Responsibilities

2. OVERVIEW - ORGANIZATIONAL ROADBLOCKS
- Traditional Organization versus Customer Driven Organization
- Types of Organizational Roadblocks
- Change Resistance Curve
- Common Resistance Points
- Overcoming Resistance Points
- Force Field Analysis

3. OVERVIEW - ROLE OF COMMUNICATION AND SELECTION CRITERIA IN BLACK BELT
- Black Belt Role Summary
- Black Belt Communication Expectations
- Black Belt Selection Criteria

4. OVERVIEW - OVERVIEW OF CONTINUOUS IMPROVEMENT
- Continual Improvement Process
- Continuous versus Continual Improvement
- Kaizen – Continual Improvement

5. OVERVIEW OF LEAN
- What is Lean
- History of Lean
- Principles of Lean
- Key Benefits of Implementing Lean
- Why Lean before Six Sigma

6. OVERVIEW - LEAN CONCEPTS EXPLAINED

- Warusa Kagen
- 3Ms
- Types of Waste (TIMWOODS)
- Mottainai
- Hoshin Kanri
- Takt Time
- Cycle Time
- Lead Time
- Lead Time – Assignment
- Production Cycle Efficiency
- Batch Size
- Every Part Every Interval (EPEI)
- EPEI Calculation Spreadsheet
- Batch Size – Assignment
- Crew Size
- Crew Size – Assignment
- Standardized Work in Progress (SWIP)

7. OVERVIEW - LEAN TOOLS EXPLAINED

- 5S
- 5S – Audit Worksheet
- SMED
- Heijunka
- Heijunka – An Example
- Genchi Genbutsu
- Value Stream Mapping (VSM)

8. SECTION 2 - DFSS: PRE-DEFINE AND DEFINE (DMAIC)

- Design for Six Sigma (DFSS)
- DFSS Approach to Problem Solving
- DMAIC Approach to Problem Solving
- DMAIC versus DFSS
- DFSS Tools
- Toll Gate Review
- Benchmarking
- MSA
- VOC
- Needs Vs. Requirements
- KJ Diagram
- Quality Function Deployment (QFD)
- Kano Model
- HOQ
- AHP
- Pugh Matrix for Concept Selection
- Sample Pugh Matrix
- Monte Carlo Simulation
- Design for X

9. DFSS: PRE-DEFINE AND DEFINE (DMAIC) - PRE-DEFINE

- Prerequisites of a Six Sigma Project
- Qualifications of a Six Sigma Project
- Cornerstones of a Six Sigma Project
- Six Sigma Deployment Cycle Plan
- 10 Point Ongoing Project Evaluation
- Project Prioritization Matrix
- Enterprise Wide versus LOB View
- Enterprise Wide – Roles and Responsibilities
- NPV (Net Present Value)
- Internal Rate of Return (IRR)
- NPV and IRR – An Example

10. DFSS: PRE-DEFINE AND DEFINE (DMAIC) – DEFINE
- Define – Key Objectives
- Voice of Customer
- Voice of Business
- Voice of Process
- VOC, VOB, and VOP
- Kano Model
- Assignment
- Translation to Project Y
- Quality Function Deployment
- Process Map
- Y – Baseline Performance
- SIPOC
- Project Charter
- The Problem Statement and the Goal Statement
- RACI Matrix
- Business Metrics
- Project Deliverables
- Project Scheduling
- Define – Roles and Responsibilities
- Define – Tools Summary

11. SECTION 3 – MEASURE
- Define Phase Toll Gate Review
- DFMEA
- Cause and Effect Matrix (CE Matrix)

LSSBB Course Agenda

12. MEASURE - TYPES OF DATA AND MEASUREMENT SCALES
- Objectives of Measure Phase
- What is a Process
- Flowcharts
- SIPOC
- Metrics
- Measurement Scales
- Types of Data

13. MEASURE - CENTRAL TENDENCY AND DISPERSION
- Central Tendency and Dispersion – Introduction
- Mean
- Mode
- Range
- Variance
- Standard Deviation
- Mean Deviation

14. MEASURE - MEASUREMENT SYSTEM ANALYSIS
- Purpose of Measurement System Analysis
- Measurement System Errors
- Properties of Good Measurement Systems
- Measurement System Errors Illustrated
- Measurement System Discrimination
- Bias
- Measurement System Analysis – Process Flow
- Part Variation
- Measurement Systems Analysis Formulas and Example
- Measurement Systems Analysis Graphs
- Attribute RR
- When to Do Measurement System Analysis?
- Data Collection Plan
- Data Collection Plan Template and Example

15. MEASURE - STABILITY CONDITIONS

- Controlled Process and Variation
- Special Causes of Variation
- Common Causes of Variation
- Stability Introduction and SPC
- Stability Check with Minitab
- Stability Check using Run Charts
- Central Limit Theorem

16. MEASURE - CAPABILITY METRICS

- Process Capability Pre-Considerations
- Process Capability Indices for Continuous Data
- Process Capability Indices Interpretation
- Process Capability for Discrete Data
- Non-Normal Capability Analysis
- Assignment

17. MEASURE - VARIATIONS, VARIABILITY, CAPABILITY, AND PROCESS CONDITIONS

- Variations and Variability
- Capability and Process Conditions

18. MEASURE - DATA DISTRIBUTIONS

- Permutations and Combinations
- Frequency and Cumulative Distributions
- Binomial Distribution
- Poisson Distribution
- Normal Distribution
- Exponential Distribution

19. MEASURE - SIGMA SHIFT, MEAN SHIFT, AND REDUCING VARIATIONS

- Sigma Shift
- Mean Shift or Reducing Variations
- Baseline Data
- Summary
- Measure Phase Summary
- Measure: Activity Summary
- Measure Tools Summary

20. SECTION 4 - ANALYZE

- Analyze Phase – Introduction
- Pre-Analyze Considerations
- Objectives of Analyze3
- Visually Displaying Data

21. VALUE STREAM

- Value, Waste, and NVA Activities
- What is a Value Stream?
- Value Stream – Example
- Value Stream Analysis – Mudra
- Value Stream Map
- Spaghetti Charts
- Spaghetti Chart – Should Be

22. ANALYZE - SOURCES OF VARIATION

- Sources of Variation
- Cause and Effect Diagram
- Affinity Diagram
- Box Plot

23. ANALYZE – REGRESSION

- Objectives of Regression Analysis
- Concepts of Regression Analysis
- Simple Linear Regression
- Multiple Linear Regression
- Best Subsets Regression and Stepwise Regression

24. ANALYZE - CONFIDENCE INTERVALS

- Concepts of Confidence Intervals and Confidence Intervals Testing Confidence Intervals for Difference between Two Means
- Confidence Intervals Working
- Chi-Square Confidence Intervals for Variances
- Z Confidence Intervals for Proportions
- 24.8. Chi-Square and Probability
- T Distribution Confidence Intervals

25. ANALYZE - PARAMETRIC HYPOTHESIS TESTING

- Hypothesis Testing Objectives
- Hypothesis Testing Concepts
- Null and Alternate Hypothesis
- Type 1 Error
- Type II Error
- Significance Level (α)
- β and Power
- P-Value, and Acceptance and Rejection Conditions
- Sample Size Determination for Tests
- 1 Sample z Test
- 2 Sample z test
- f-Test of Equality of Variances
- 1 Sample t Test
- 2 Sample t Test
- Paired t Test
- Paired t Test Interpretation
- ANOVA
- One-Way ANOVA
- Two-Way ANOVA with Replication

26. ANALYZE - NONPARAMETRIC HYPOTHESIS TESTING

- Nonparametric Testing Conditions
- Mann-Whitney Test
- 1 Sample Sign
- Wilcoxon Sign Rank Test
- Kruskal Wallis
- Mood's Median
- Friedman ANOVA

27. ANALYZE ADDITIONALS – CATEGORICAL DATA AND CURRENT REALITY TREE

- Categorical Data Analysis
- Current Reality Tree
- Summary
- Activity Summary – Analyze
- Tools Summary – Analyze

28. SECTION 5 – IMPROVE

- Pre-Improve Considerations
- Model Adequacy Checking
- Multi Vari Charts
- 7M Tools
- Activity Network Diagram
- Point and Interval Estimation
- Porter's Five Forces
- Pugh Analysis
- Lean 5S
- Summary
- Agenda
- Introduction to DOE
- Types of Designed Experiments
- Main and Interaction Effects
- Replication
- Randomization
- Blocking
- Confounding
- Sum of Squares Analysis

29. IMPROVE - DESIGN OF EXPERIMENTS – PRACTICE

- Introduction to 2 Factor Factorial Design
- 22 Design
- 22 Design Summary
- General 2k Design
- Single Replicate of 2k Design
- Half Fractional 2k-1 Design
- Quarter Fractional 2k-2 Design
- 3k Factorial Design
- Response Surface Designs
- Nested Designs
- Split Plot Designs – Introduction
- Taguchi's Designs
- Taguchi's L4 Design
- Taguchi's L4 Design Graphs
- Taguchi's L8 Design
- Plackett Burman's Design
- Quality Function Deployment (House of Quality)

30. IMPROVE - BRAINSTORMING, SOLUTIONS PRIORITIZATION AND COST BENEFIT ANALYSIS

- Brainstorming
- Multi-Voting
- Brainstorming, Prioritization, and Cost Benefit Analysis
- Poka Yoke

31. IMPROVE - PILOTING, VALIDATING, AND FMEA

- Pilot Solutions
- Piloting Tools
- Paired t Test
- Paired t Test Interpretations
- Improve – Next Steps
- Failure Mode Effects Analysis
- Summary
- Improve – Activity Summary

32. SECTION 6 – CONTROL

- Pre-Control Considerations
- Assessing the Results of Process Improvement
- Pre-Control Considerations
- Rational Subgrouping

33. CONTROL - VARIABLES AND ATTRIBUTES CONTROL CHARTS

- Concepts of Variables Control Charts
- Variables Control Charts
- EWMA Charts
- Cusum Charts
- Attribute Control Charts

34. CONTROL - MEASUREMENT SYSTEM ANALYSIS, CONTROL PLAN, AND PROJECT CLOSURE

- Measurement System Analysis
- Control Plan
- Project Closure

35. CONTROL - INTRODUCTION TO TOTAL PRODUCTIVE MAINTENANCE

- Total Productive Maintenance (TPM)
- Summary

LSSBB - Eligibility Requirements

- In order to achieve the professional designation of IASSC Certified Black Belt (IASSC-CBB™) from the International Association for Six Sigma Certification, candidates must sit for the IASSC Certified Lean Six Sigma Black Belt Exam and achieve a minimum score of 580 points out of a total potential of 750 points.

- There are no prerequisites required in order to sit for the IASSC Certified Lean Six Sigma Black Belt Exam.
  Prerequisites to become Six Sigma Black Belt Certified:
  To attain Six Sigma Black Belt certification, professionals require two complete projects with signed affidavits or one complete project with a signed affidavit and three years of work experience, in one or more areas of the Six Sigma Body of Knowledge.

- IASSC Certified Lean Six Sigma Black Belt™ (ICBB™) Exam Fees
  The cost for the IASSC Certified Black Belt Exam is $395 USD.

Source: IASSC Website https://www.iassc.org/six-sigma-certification/black-belt-certification/ and IASSC FAQs

- The IASSC Certified Lean Six Sigma Black Belt Exam™ is a 150 question, closed book, proctored exam with a 4 hour allotted time. Some forms of this exam may also include up to an additional 15 non-graded questions*. The Exam contains approximately 30 multiple-choice and true/false questions from each major section of the IASSC Lean Six Sigma Black Belt Body of Knowledge.

Source: https://www.iassc.org/six-sigma-certification/black-belt-certification/

LSSBB - Target Audience

There are no prerequisites for attending the course or to take the IASSC Certified Black Belt Exam.

Prerequisites to become Six Sigma Black Belt Certified:

To attain Six Sigma Black Belt certification, professionals require two complete projects with signed affidavits or one complete project with a signed affidavit and three years of work experience, in one or more areas of the Six Sigma Body of Knowledge.

The course is suitable for:

- Senior Management (especially if the company intends to implement Lean Six Sigma)
- Team Leaders
- Software Professionals
- Project Managers
- Quality Assurance Engineers
- Software Quality Assurance Team Members

Source: http://www.iassc.org/faqs/

We are an Education Technology company providing certification training courses to accelerate careers of working professionals worldwide. We impart training through instructor-led classroom workshops, instructor-led live virtual training sessions, and self-paced e-learning courses.

We have successfully conducted training sessions in 108 countries across the globe and enabled thousands of working professionals to enhance the scope of their careers.

Our enterprise training portfolio includes in-demand and globally recognized certification training courses in Project Management, Quality Management, Business Analysis, IT Service Management, Agile and Scrum, Cyber Security, Data Science, and Emerging Technologies. Download our Enterprise Training Catalog here.

Visit us at **www.icertglobal.com** for more information about our professional certification training courses in your location.

iCert Global
Anywhere, Anytime Learning

**6220 Westpark Dr, Suite 180,
Houston, TX 77057**

Facebook	Linkedin	Twitter	YouTube	Instagram	Pinterest

Contact Us:

USA: +1-(713)-287-1213 / +1-(713)-287-1214 / +1-(713)-287-1053 / +1-(713)-287-1355

UK: +44-1-322-476-113 | **AUS:** +61-2 6171 0726 | **BHR:** +973-16-196142

IND: +91-988-620-5050 | **Operations:** +1-(713)-287-1187, +1-(713)-287-1319

WhatsApp us on +1-(713)-287-1213

Corporate Training: +1-(713)-518-1852

Email us at info@icertglobal.com | support@icertglobal.com
Visit us at www.icertglobal.com