

IASSC Accredited Training Organization

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Black Belt Certification



Certified Lean Six Sigma Black Belts

The IASSC Certified Lean Six Sigma Black Belt (ICBB) is a professional who is well versed in the Lean Six Sigma Methodology, who leads improvement projects, typically in a full-time role. A Lean Six Sigma Black Belt possesses a thorough understanding of all aspects within the phases of D-M-A-I-C. They understand how to perform and interpret Six Sigma tools and how to use standard principles of Lean.

Certification Testing

The IASSC Certified Lean Six Sigma Black Belt (ICBB) Exam is a 4 hour 150 question proctored exam based on the IASSC Universally Accepted Lean Six

Sigma Body of Knowledge for Black Belts. The Exam contains approximately 30 multiple-choice and true/false questions from each major section of the ILSSBOK for Black Belts and is administered in more than 8,000 Testing Centers located within 165 countries throughout the world.

Requirements

In order to achieve the professional designation of IASSC Certified Black Belt (ICBB) 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.

Purchase of a Black Belt Exam Voucher for \$395US through this link [IASSC Certification Exam Voucher - Lean Six Sigma Black Belt](#) .

Preparation

For those who wish to sit for the exam it is recommended, but not required, that Lean Six Sigma training is obtained through a [qualified institution - My Six Sigma Trainer](#). Lean Six Sigma trainer or corporate program. It is also recommended, although not required, that those sitting for the exam have some degree of real-world Lean Six Sigma work experience and project application experience.

Certification

Upon successful achievement Professionals will receive a Certificate, suitable for framing, issued by the International Association for Six Sigma Certification or its designated Examination Institute, PeopleCert. Professionals will also receive IASSC Marks and the IASSC Marks Usage Policy which may be used on public profiles such as LinkedIn. Professionals may use the designation ICBB, IASSC Certified Black Belt or any approved variation of the designation after their name in accordance with the IASSC Marks Usage Policy.

Black Belt Body of Knowledge

The IASSC Universally Accepted Lean Six Sigma Body of Knowledge (ILSSBOK) is an embodiment of the consensus of what industry expects of a Lean Six Sigma Black Belt, Lean Six Sigma Green Belt and a Lean Six Sigma Yellow Belt.

The ILSSBOK is the result of research that was conducted over a two year period with the assistance of the leading industry publication house, Open Source Six Sigma. The goal of this project was to characterize the standard knowledge requirements that are universally expected of a Lean Six Sigma Black Belt, Lean Six Sigma Green Belt and a Lean Six Sigma Yellow Belt. With input from 1000's of Deployment Leaders, Master Blacks Belts, Black Belts and Green Belts from 100's of companies and industry sectors the ILSSBOK is truly the Voice of the Industry.

This is a significant breakthrough, for the first time in the history of the Lean Six Sigma the industry itself has defined what it deems as a relevant and practical version of the knowledge expectations of a Lean Six Sigma Black Belt, Green Belt and Yellow Belt. Today, IASSC continues this research and accepts ongoing industry feedback to ensure the standards continue to accurately represent the market expectations.

The ILSSBOK consists of five primary sections each of which is broken into sub-categories. This Body of Knowledge serves as the basis for what many of today's leading Lean Six Sigma companies consider to be standard and expected knowledge requirements of a Lean Six Sigma Black Belt, Lean Six Sigma Green Belt and Lean Six Sigma Yellow Belt. This body of knowledge also serves as the foundation upon which IASSC Certification examinations are built.

The IASSC Certified Black Belt Exam is constructed based on the topics within the Body of Knowledge listed below. Questions may test up to the complexity level of "Analyze" as defined by Levels of Cognition based on Bloom's Taxonomy – Revised (2001) (see below).

IASSC Universally Accepted Lean Six Sigma Body of Knowledge for Black Belts

1.0 Define Phase

1.1 The Basics of Six Sigma

1.1.1 Meanings of Six Sigma

1.1.2 General History of Six Sigma & Continuous Improvement

1.1.3 Deliverables of a Lean Six Sigma Project

1.1.4 The Problem Solving Strategy $Y = f(x)$

1.1.5 Voice of the Customer, Business and Employee

1.1.6 Six Sigma Roles & Responsibilities

1.2 The Fundamentals of Six Sigma

1.2.1 Defining a Process

1.2.2 Critical to Quality Characteristics (CTQ's)

1.2.3 Cost of Poor Quality (COPQ)

1.2.4 Pareto Analysis (80:20 rule)

1.2.5 Basic Six Sigma Metrics

a. including DPU, DPMO, FTY, RTY Cycle Time, deriving these metrics and these metrics

1.3 Selecting Lean Six Sigma Projects

1.3.1 Building a Business Case & Project Charter

1.3.2 Developing Project Metrics

1.3.3 Financial Evaluation & Benefits Capture

1.4 The Lean Enterprise

1.4.1 Understanding Lean

1.4.2 The History of Lean

1.4.3 Lean & Six Sigma

1.4.4 The Seven Elements of Waste

a. Overproduction, Correction, Inventory, Motion, Overprocessing, Conveyance, Waiting.

1.4.5 5S

a. Straighten, Shine, Standardize, Self-Discipline, Sort

2.0 Measure Phase

2.1 Process Definition

2.1.1 Cause & Effect / Fishbone Diagrams

2.1.2 Process Mapping, SIPOC, Value Stream Map

2.1.3 X-Y Diagram

2.1.4 Failure Modes & Effects Analysis (FMEA)

2.2 Six Sigma Statistics

2.2.1 Basic Statistics

2.2.2 Descriptive Statistics

2.2.3 Normal Distributions & Normality

2.2.4 Graphical Analysis

2.3 Measurement System Analysis

2.3.1 Precision & Accuracy

2.3.2 Bias, Linearity & Stability

2.3.3 Gage Repeatability & Reproducibility

2.3.4 Variable & Attribute MSA

2.4 Process Capability

2.4.1 Capability Analysis

2.4.2 Concept of Stability

2.4.3 Attribute & Discrete Capability

2.4.4 Monitoring Techniques

3.0 Analyze Phase

3.1 Patterns of Variation

3.1.1 Multi-Vari Analysis

3.1.2 Classes of Distributions

3.2 Inferential Statistics

3.2.1 Understanding Inference

3.2.2 Sampling Techniques & Uses

3.2.3 Central Limit Theorem

3.3 Hypothesis Testing

3.3.1 General Concepts & Goals of Hypothesis Testing

3.3.2 Significance; Practical vs. Statistical

3.3.3 Risk; Alpha & Beta

3.3.4 Types of Hypothesis Test

3.4 Hypothesis Testing with Normal Data

3.4.1 1 & 2 sample t-tests

3.4.2 1 sample variance

3.4.3 One Way ANOVA

a. Including Tests of Equal Variance, Normality Testing and Sample Size calculation, performing tests and interpreting results.

3.5 Hypothesis Testing with Non-Normal Data

3.5.1 Mann-Whitney

3.5.2 Kruskal-Wallis

3.5.3 Mood's Median

3.5.4 Friedman

3.5.5 1 Sample Sign

3.5.6 1 Sample Wilcoxon

3.5.7 One and Two Sample Proportion

3.5.8 Chi-Squared (Contingency Tables)

a. Including Tests of Equal Variance, Normality Testing and Sample Size calculation, performing tests and interpreting results.

4.0 Improve Phase

4.1 Simple Linear Regression

4.1.1 Correlation

4.1.2 Regression Equations

4.1.3 Residuals Analysis

4.2 Multiple Regression Analysis

4.2.1 Non- Linear Regression

4.2.2 Multiple Linear Regression

4.2.3 Confidence & Prediction Intervals

4.2.4 Residuals Analysis

4.2.5 Data Transformation, Box Cox

4.3 Designed Experiments

4.3.1 Experiment Objectives

4.3.2 Experimental Methods

4.3.3 Experiment Design Considerations

4.4 Full Factorial Experiments

4.4.1 2k Full Factorial Designs

4.4.2 Linear & Quadratic Mathematical Models

4.4.3 Balanced & Orthogonal Designs

4.4.4 Fit, Diagnose Model and Center Points

4.5 Fractional Factorial Experiments

4.5.1 Designs

4.5.2 Confounding Effects

4.5.3 Experimental Resolution

5.0 Control Phase

5.1 Lean Controls

5.1.1 Control Methods for 5S

5.1.2 Kanban

5.1.3 Poka-Yoke (Mistake Proofing)

5.2 Statistical Process Control (SPC)

5.2.1 Data Collection for SPC

5.2.2 I-MR Chart

5.2.3 Xbar-R Chart

5.2.4 U Chart

5.2.5 P Chart

5.2.6 NP Chart

5.2.7 X-S chart

5.2.8 CumSum Chart

5.2.9 EWMA Chart

5.2.10 Control Methods

5.2.11 Control Chart Anatomy

5.2.12 Subgroups, Impact of Variation, Frequency of Sampling

5.2.13 Center Line & Control Limit Calculations

5.3 Six Sigma Control Plans

5.3.1 Cost Benefit Analysis

5.3.2 Elements of the Control Plan

5.3.3 Elements of the Response Plan

Levels of Cognition based on Bloom's Taxonomy – Revised (2001)

These levels are from “Levels of Cognition” (from Bloom's Taxonomy – Revised, 2001). They are listed in order from the least complex to the most complex.

Remember: Recall or recognize terms, definitions, facts, ideas, materials, patterns, sequences, methods, principles, etc.

Understand: Read and understand descriptions, communications, reports, tables, diagrams, directions, regulations, etc.

Apply: Know when and how to use ideas, procedures, methods, formulas, principles, theories, etc.

Analyze: Break down information into its constituent parts and recognize their relationship to one another and how they are organized; identify sublevel factors or salient data from a complex scenario.

Evaluate: Make judgments about the value of proposed ideas, solutions, etc., by comparing the proposal to specific criteria or standards.

Create: Put parts or elements together in such a way as to reveal a pattern or structure not clearly there before; identify which data or information from a complex set is appropriate to examine further or from which supported conclusions can be drawn.

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