PINNACLE
PROFESSIONAL DEVELOPMENT, LLC

Lean Six Sigma Black Belt Course Outline

Course Overview

Become an expert problem solver and leader in process improvement with our Lean Six Sigma Black Belt Certification. This prestigious certification opens doors to a world of career opportunities and demonstrates your ability to drive efficiency and excellence.

Lean Six Sigma Black Belt Exam Details

Designation Earned: **accredited** LSSBB (Lean Six Sigma Black Belt)
Accrediting body: The Council for Six Sigma Certification (CSSC)

Lean Six Sigma Black Belt certification exam is a three-hour, online, 150-question test covering the full Lean Six Sigma Black Belt Curriculum. The passing score is 80%. All students get two attempts. You will need a reliable internet connection, a personal computer, and a web browser.
You will be issued a certification serial number in the certification body's Official Certification Directory. You will also be issued a digital certificate with the certification body's seal affixed.

Course Details

Public Classes (35 contact hours)	Public Live, Virtual Classes: Monday-Friday, 9:00 to 5:00 Eastern • March 18-22, 2024 • July 22-26, 2024 • November 18-22, 2024 **Various options and dates available for private classes. Call or email us!**
Course Materials Provided	Digital materials providing extensive coverage of Lean and Six Sigma principles and fundamentals. • Detailed Exploration of the DMAIC Methodology • In-Depth Statistical analysis with Step-by-Step Instruction using Minitab, JMP, and SigmaXL • Presentation Slide deck • Examples and Case Studies • Chapter-Based Practice Questions
Course Price	$3,495 per participant Discounts available for: • Early enrollment (5 weeks prior to class) • Military veterans • Groups enrollments **Call or email us for details!**
PMI® PDUs	35 contact hours. Ways of Working: 30; Business Environment: 5 PMI PDU Number: 3446JW7YLE

Prerequisites

Experience in leading process improvement or continuous improvement initiatives strongly recommended. Lean Six Sigma Green Belt recommended, but not required.

Pinnacle Professional Development, LLC
www.pinnacleprodev.com
37510 Sienna Oaks Drive
New Baltimore, MI 48047
For sales information, contact Brian Salk, PhD 586-295-2519; brian@pinnacleprodev.com

Black Belt Certification Benefits

Career

- Career Advancement – Achieving Black Belt Certification opens doors to higher-paying and more senior positions in virtually every industry.
- Problem-Solving Expertise – Develop exceptional problem-solving skills, enabling you to tackle complex issues and drive continuous improvement.
- Leadership Skills – Black Belts are natural leaders in process improvement teams, capable of guiding and inspiring others.
- Earning Potential – A Black Belt certification often leads to higher salaries and lucrative opportunities as organizations value your expertise.
- Global Recognition – Lean Six Sigma Black Belt Certification is globally recognized, enhancing your career prospects both nationally and internationally.
- Process Optimization – Learn to optimize processes, reduce defects, and enhance customer satisfaction, making you a valuable asset to any organization.
- Project Management – Acquire strong project management skills, ensuring successful implementation of improvement projects.
- Professional Growth – Continuous learning and skill development are integral to Lean Six Sigma, allowing for ongoing professional growth.

Instructor

Your training class is only as good as your instructor. Your instructor has over 25 years of experience leading projects and continuous improvement initiatives. He has effectively combined and applied best practices from Lean Six Sigma, traditional project management, and agile project management to meet client business goals successfully. He has tens of thousands of hours training candidates on Lean Six Sigma, project management (e.g., PMP®, Scrum), and technical IT skills.
He has helped hundreds of candidates earn their LSSBB and LSSGB certifications since 2010.

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Lean Six Sigma Black Belt Course Outline

1.0 Define Phase

- 1.1 Overview of Six Sigma
  - 1.1.1 What is Six Sigma
  - 1.1.2 Six Sigma History
  - 1.1.3 Six Sigma Approach Y = f(x)
  - 1.1.4 Six Sigma Methodology
  - 1.1.5 Roles & Responsibilities
- 1.2 Fundamentals of Six Sigma
  - 1.2.1 Defining a Process
  - 1.2.2 VOC & CTQ's
  - 1.2.3 QFD
  - 1.2.4 Cost of Poor Quality
  - 1.2.5 Pareto Analysis (80:20 rule)
- 1.3 Lean Six Sigma Projects
  - 1.3.1 Six Sigma Metrics
  - 1.3.2 Rolled Throughput Yield
  - 1.3.3 Business Case & Charter
  - 1.3.4 Project Team Selection
  - 1.3.5 Project Risk Management
  - 1.3.6 Project Planning
- 1.4 Lean Fundamentals
  - 1.4.1 Lean and Six Sigma
  - 1.4.2 History of Lean
  - 1.4.3 Seven Deadly Muda
  - 1.4.4 Five-S (5S)
- Define Phase Practice Test

2.0 Measure Phase

- 2.1 Process Definition
  - 2.1.1 Cause & Effect Diagram
  - 2.1.2 Cause & Effect Matrix
  - 2.1.3 Process Mapping
  - 2.1.4 Failure Modes & Effects Analysis
  - 2.1.5 Theory of Constraints
- 2.2 Six Sigma Statistics
  - 2.2.1 Basic Statistics
  - 2.2.2 Descriptive Statistics
  - 2.2.3 Distributions & Normality
  - 2.2.4 Graphical Analysis
- 2.3 MSA
  - 2.3.1 Precision & Accuracy
  - 2.3.2 Bias, Linearity & Stability
  - 2.3.3 Gage R&R
  - 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
- Measure Phase Practice Test

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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 Sample Size
  - 3.2.4 Central Limit Theorem
- 3.3 Hypothesis Testing
  - 3.3.1 Goals of Hypothesis Testing
  - 3.3.2 Statistical Significance
  - 3.3.4 Risk; Alpha & Beta
  - 3.3.5 Types of Hypothesis Test
- 3.4 Hypothesis Tests: Normal Data
  - 3.4.1 1 & 2 sample t-tests
  - 3.4.2 1 sample variance
  - 3.4.3 One Way ANOVA
- 3.5 Hypothesis Tests: Non-Normal Data
  - 3.5.1 Mann-Whitney & Mood's Median
  - 3.5.2 Kruskal-Wallis
- 3.5.3 Moods Median
- 3.5.4 Friedman
  - 3.5.5 1 Sample Sign
  - 3.5.6 1 Sample Wilcoxon
  - 3.5.7 1 and 2 Sample Proportion
  - 3.5.8 Chi-Squared
  - 3.5.9 Test of Equal Variances
- Analyze Phase Practice Test

4.0 Improve Phase

- 4.1 Simple Linear Regression
  - 4.1.1 Correlation
  - 4.1.2 X-Y Diagram
  - 4.1.3 Regression Equations
  - 4.1.4 Residuals Analysis
- 4.2 Multiple Regression Analysis
  - 4.2.1 Non-Linear Regression
  - 4.2.2 Multiple Linear Regression
  - 4.2.3 Confidence Intervals
  - 4.2.4 Residuals Analysis
  - 4.2.5 Data Transformation, Box Cox
  - 4.2.6 Stepwise Regression
  - 4.2.7 Logistic Regression
- 4.3 Designed Experiments
  - 4.3.1 Experiment Objectives
  - 4.3.2 Experimental Methods
  - 4.3.3 DOE Design Considerations
- 4.4 Full Factorial Experiments
  - 4.4.1 2k Full Factorial Designs
  - 4.4.2 Linear & Quadratic Models
  - 4.4.3 Balanced & Orthogonal Designs
  - 4.4.4 Fit, Model & Center Points
- 4.5 Fractional Factorial Experiments
  - 4.5.1 Designs
  - 4.5.2 Confounding Effects
  - 4.5.3 Experimental Resolution
- Improve Phase Practice Test

5.0 Control Phase

- 5.1 Lean Controls
  - 5.1.1 Control Methods for 5S
  - 5.1.2 Kanban
  - 5.1.3 Poka-Yoke
- 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, Variation, Sampling
  - 5.2.13 Center Line & Control Limits
- Control Phase Test

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