

Lean Six Sigma Black Belt

Applied Technology Academy

This five-day course provides you with the knowledge and skills to become an expert problem solver and leader in process improvement and prepares you for the 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. Pricing includes course instruction, all course materials, and two exam vouchers.

LEVEL Intermediate	DURATION 5 Days	EXPERIENCE 3 years: Six Sigma Green Belt	AVERAGE SALARY \$110,442	LABS No
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Course Overview

During class, participants will be introduced to the practical and testable concepts found on the LSSBB (Lean Six Sigma Black Belt) exam, accredited by The Council for Six Sigma Certification (CSSC). Participants receive five days (35 contact hours) of instruction, plus numerous online tutorials to help reinforce the principles. Several banks of sample questions are included to help the participants gauge their readiness to take the LSSBB exam. The passing score needed for the LSSBB exam is 80%.

At the completion of this course, participants will be able to do the following:

- Understand the concept of Six Sigma and the DMAIC approach to process improvement
- Understand the tools involved in the Define, Measure, Analyze, Improve, and Control phases
- Understand the use of the tools in characterizing processes, analyzing process data, solving problems, and controlling processes
- Use the key tools to solve practical business problems
- Lead small Six Sigma project teams or assist Black Belts to deliver tangible business results on larger projects
- Course Benefits

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.

Course Outline

- **Lesson 1: 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
- **Lesson 2: 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
- **Lesson 3: 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
- **Lesson 4: 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
- **Lesson 5: 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 Practice Test

Intended Audience

This course is designed for those with experience in leading process improvement or continuous improvement initiatives who want to earn their LSSBB certification, as well as individuals looking to broaden their knowledge of continuous improvement concepts and tools. Lean Six Sigma Green Belt is recommended, but not required.

Prerequisites

Professionals at all levels can benefit by learning how to use the core concepts of Lean and Six Sigma to make better business decisions, and how to apply tools and methodologies to solve critical business process problems.

Follow-On Courses

PMI Project Management Professional (PMP)

Ready to enroll? Call 800.674.3550 or email Info@AppliedTechAc.com — private team cohorts, GSA MAS purchasing, military credentialing funding, VA GI Bill and VR&E and student financing available.