



Lean Six Sigma Black Belt

Module 1 – Lean Six Sigma Black Belt Overview

- Course Introduction
- What is Six Sigma?
- Philosophy of Six Sigma
- Origins of the Tools
- DMAIC, Part 1
- DMAIC, Part 2
- IPO Model
- Leadership Roles
- Owners and Stakeholders
- Voice of the Customer (VOC)
- SIPOC Diagrams
- Process Performance Metrics
- Financial Benefits

Module 2 – Tools and Techniques to Monitor Variation

- Process Analysis
- Concept of Variation and Normal Curve
- Quincunx Process Demonstration
- Types of Data and Types of Variation
- Histograms
- Histogram Analysis
- Six Sigma Math Primer (Supplemental Lecture)
- Basics of Probability
- Measures of Central Tendency
- Concept of Standard Deviation
- Standard Deviation Technically
- Standard Deviation Exercises
- Cp, CR, Cpm and Cm
- Cpk Alone, and Cp and Cpk Together
- Cp and Cpk Calculations
- Capability Exercise 1
- Capability Exercise 2
- Capability Exercise 3
- Z Upper and Z Lower
- Long-Term and Short-Term Capability and Normal Probability Plot

Module 3 – Distributions and Data Analysis

- Introduction to Distribution and Data Analysis
- Binomial Distribution



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Using Binomial Distribution Tables
Hypothesis Testing
Applying Poisson
Applying Normal
Chi Square, Part 1
Chi Square, Part 2
Chi Square, Part 3
Point and Interval Estimation
Applying Student's t-Distribution
Applying Student's t-Distribution—Comparing Two Population Means
Applying F Distribution
Paired Comparison Tests
When to Use Hypergeometric
When to Use Bivariate
When to Use Exponential
When to Use Lognormal
Analysis of Variance (ANOVA), Part 1
Analysis of Variance (ANOVA), Part 2
Module 3 Review and Module 4 Introduction
Module 4 – Tools and Techniques to Control Variation
Introduction to Control Chart Concepts
Control Chart Concepts
Control Chart Construction
XmR Charts
Control Chart Project
Short Runs and Moving Average Control Charts
Short Runs and Exponentially Weighted Moving Averages (EWMA)
Control Chart Wrap-Up
Attribute Charts—p Charts
Attribute Charts—np, c, u Charts
Pre-Control
Measurement Considerations
Module 5 – Design of Experiments
Introduction to Design of Experiments (DOE)
Planning and Organizing Experiments
Full Factorial Designs
Analyzing Full Factorial Designs
Fractional Factorial Designs, Part 1
Fractional Factorial Designs, Part 2
Taguchi Design