International Academic Institute

European Union

SIX SIGMA BLACK BELT CERTIFICATION

Course Objectives

- Achieve significant improvements in critical business processes.
- Apply statistical and problem solving tools to an improvement project brought to class on the first day.
- Reduce process variation.
- Eliminate waste and defects by applying lean and Six Sigma.
- Collect, analyze, and quantify data that enable process improvements.
- Learn how to execute the Six Sigma methodology.
- Establish and define process capability.
- Identify and eliminate dominant process variation sources.
- Characterize and optimize processes by computing and applying statistical techniques.
- Design, simulate, and execute designed experiments that depict validated improvement.
- Learn how to plan and implement process control to hold project gains

Who should attend?

This course is designed for individuals from diverse organizational functions—operations, quality, logistics, finance, production, engineering, and other staff functions seeking to bring significant business results to their organizations. Participants are traditionally well versed in technical aspects of their jobs, are team leaders, and are effective project facilitators.

Certification

Participants will got accredited diploma from the International Academic Institute in Six Sigma Black Belt

Contact

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Course Outlines

Why Six Sigma
Definition and Graphical View of Six Sigma
Overview of Business Applications
Example Sigma Levels
Introduction to DPMO and Cost as Metrics
Comparisons Between Typical TQM and Six Sigma Programs ; Origins and Success Stories

Six Sigma Projects
Project Focus -Selecting Projects
Overview of DMAIC Methodology
Project Reporting

DEFINE: Project Definition
Tasks - Work Breakdown Structure
Pareto Diagrams
Process Maps
Matrix Diagrams
Project Charters
Reporting

DEFINE: Project Financials
Quality Cost Classifications
Quantifying Project Benefits
Calculations

DEFINE: Change Management/Teams
Problems With Change
Achieving Buy-in
Team Formation, Rules, and Responsibilities
Stages of Team Development
Overcoming Problems
Consensus Building
- Affinity Diagram
- Nominal Group Technique
- Prioritization Matrix

MEASURE: Establishing Process Baseline
Enumerative vs. Analytic Statistics
Process Variation
Deming's Red Bead
Benefits of Control Charts
Requirements vs. Control
Tampering
Control Chart Interpretation
Relative to Process Baseline Estimates

MEASURE: Individuals Data
Uses - Construction and Calculations
Assumptions
Sampling Considerations
Interpretation
Overview of Other Individuals Charts
Run Charts
Moving Average Charts
EWMA Charts

MEASURE: Attribute Charts
Uses ; Selection
Construction and Calculations
Sampling Considerations

MEASURE: Short Run SPC
Uses ; Calculations
Nominals Chart
Stabilized Chart

How to Deploy Six Sigma
Leadership Responsibilities
Description of the Roles and Responsibilities
Resource Allocation
Data-driven Decision Making
Organizational Metrics and Dashboards

Incorporating Voice of the Customer
Goal Posts vs. Kano
Customer Focus and the Leadership Role
Overview of QFD
Customer Data
Big Y's, Little Y's

DEFINE: Goals and Metrics
CTC, CTQ, CTS Parameters
Measurement & Feedback
Calculating Sigma Levels
DEFINE: Project Scheduling
Activity Network Diagram
PERT Analysis
GANNT Chart'

MEASURE: Tools
Measure Stage Objectives
Flowcharts
Process Maps
SIPOC
Box-Whisker Plots
Cause and Effect Diagrams
Check Sheets
Interrelationship Digraph
Stem and Leaf Plots

MEASURE: X-Bar Charts
Uses
Construction and Calculations
Assumptions
Rational Subgroups
Sampling Considerations
Interpretation
Run Test Rules

MEASURE: Process Capability
Histograms
Probability Plots
Goodness of Fit Tests
Capability and Performance Indices
Relative to Process Control
Interpretation
Estimating Error

MEASURE: Measurement Systems Analysis
Stability Studies
Linearity Analysis
R&R Analysis
Range Method Calculations
Interpretation
Using Control Charts
Destructive Tests
ANOVA Method

ANALYZE: Lean Thinking

- Definition of Waste
- Analyzing Process for NVA
- Cycle Efficiencies
- Lead Time and Velocity
- Methods to Increase Velocity
- Standardization
- Optimization
- Level Loading
- Setup Reductions
- ANALYZE: Sources of Variation
- Multi-vari Plots
- Confidence Intervals on Mean
- Confidence Intervals on Percent
- Hypothesis Test on Mean
- Hypothesis Test on Mean of Two Samples
- Power and Sample Size
- Contingency Tables
- Non-parametric Tests
- ANALYZE: Regression Analysis
- Scatter Diagrams
- Linear Model
- Interpreting the ANOVA Table
- Confidence and Prediction Limits
- Residuals Analysis
- Overview of Multiple Regression Tools
- DOE vs. Traditional Experiments and Data Mining
- ANALYZE: Multiple Regression
- Multivariate Models
- Interaction Plots
- Interpreting ANOVA Tables
- Model Considerations
- Stepwise Regression
- Residuals Analysis
- ANALYZE: DOE Introduction
- Terminology
- DOE vs. Traditional Experiments
- DOE vs. Historical Data
- Design Planning
- Design Specification
- Selecting Responses
- Selecting Factors and Levels
- Complete Factorials
- Fractional Factorials
- ANALYZE: DOE Analysis Fundamentals
- Estimating Effects and Coefficients
- Significance Plots
- Estimating Error
- Extending Designs
- Power of Design
- Lack of Fit
- Tests for Surface Curvature
- ANALYZE: Design Selection
- Desirable Designs
- Performance
- Balance
- Orthogonality
- Resolution
- Other Design Models
- Saturated Designs
- Plackett Burman Designs
- Johns 3/4 Designs
- Central Composite Designs
- Box Behnken Designs
- Taguchi Designs (Mention)
- ANALYZE: Transforms
- Need for Transformations
- Non-constant Variance
- Box-Cox Transforms
- Calculated Parameters
- Taguchi Signal to Noise Ratios
- IMPROVE: Tools
- Improve Stage Objectives
- Tools to Prioritize Improvement Opportunities
- Tools to Define New Process Flow
- Lean Tools to Reduce NVA and Achieve Flow
- Tools to Define and Mitigate Failure Modes
- PDPC
- FMECA
- Preventing Failures
- Reference to Tools for Defining New Process Levels
- IMPROVE: Response Surface Analysis
- Objectives
- Applications
- Sequential Technique
- Steepest Ascent
- IMPROVE: Ridge Analysis
- Graphical Method
- Analytical Method
- Overlaid Contours
- Desirability Function
- IMPROVE: Simulations
- Applications
- Examples
- Applying Probabilistic Estimates
- IMPROVE: Evolutionary Operation
- Methodology
- Example
- Risks and Advantages
- CONTROL: Tools
- Control Stage Objectives
- Control Plans
- Training
- Measuring Improvement
- CONTROL: Serial Correlation
- Applications
- Estimating Autocorrelation
- Interpreting Autocorrelation
- Batch Control Charts
- Design for Six Sigma Overview
- Methodology
- System, Parameter, and Tolerance Designs