

## BLACK BELT CERTIFICATION IN LEAN SIX SIGMA

In order to receive *Black Belt Certification* in Lean Six Sigma, the participants will demonstrate knowledge in the following topics:

- Advanced Statistical Methods for Lean Six Sigma
  - Hypothesis Testing and Statistical Inference
    - Concept of Hypothesis Testing
    - One-Sample Hypothesis Testing
      - One-Sample Tests for Means
      - One-Sample Tests for Proportions
      - One-Sample test for Variance
    - Two-Sample Hypothesis Testing
      - Two-Sample Tests for Means
      - Two-Sample Tests for Means with Paired Samples
      - Two-Sample Tests for Proportions
  - Analysis of Variance
    - One-Way ANOVA
    - Two-Way ANOVA
  - Regression Analysis
    - Simple Linear Regression
    - Residual Analysis
    - Multiple Linear regression
    - Application of Excel
  - Forecasting
    - Stationary Time Series Analysis
    - Time Series with Linear Trend
    - Autoregressive Forecasting Models
    - Forecasting Models with Trend and Seasonality
- Process Improvement
  - Flexibility and Cycle Time reductions
  - Breakthrough Improvement
  - The Deming Cycle
  - Tools for Improvement
    - Analyzing Process maps
    - Kaizen Events
    - Poka-Yoke (Mistake-Proofing)
- Process Control
  - Fundamentals of Statistical Process Control
    - Run Charts and Control Charts
    - Patterns in Control Charts
  - Control Charts for Variable Data
    - $\bar{x}$  and R charts
    - $\bar{x}$  and S charts
    - Process Monitoring and Control

- Control Charts for Attribute Data
  - p Charts
  - p charts for Variable Sample Size
  - c Charts
  - u charts
  
- Design for Six Sigma
  - Quality Function Deployment
  - The House of Quality
  - Detailed Design and Analysis
    - The Taguchi Loss Function
    - Design for Manufacturability
    - Design for Failure Mode and Effects Analysis
    - Reliability Prediction in Design for Six Sigma (DFSS)
    - Design Optimization
    - Design Verification
  
- Implementing Six Sigma
  - Principles for Six Sigma Implementation
  - Organization Culture and Change Management
  - Enterprise Leadership
  - Knowledge Management