Lean Six Sigma Black Belt Curriculum Outline:

- **DEFINE PHASE**
  - **Overview of Six Sigma**
    - What is Six Sigma
    - Six Sigma History
    - Six Sigma Approach
    - Six Sigma Methodology
    - Roles & Responsibilities
  - **Fundamentals of Six Sigma**
    - Defining a Process
    - VOC & CTQ's
    - QFD
    - Cost of Poor Quality
    - Pareto Chart & Analysis
  - **Lean Six Sigma Projects**
    - Six Sigma Metrics
    - Business Case & Charter
    - Six Sigma Metrics
    - Project Team Selection
    - Project Risk Management
    - Project Planning

- **MEASURE PHASE**
  - **Process Definition**
    - Cause & Effect Diagrams
    - Cause & Effect Matrix
    - Process Mapping
    - FMEA
    - Theory of Constraints
  - **Six Sigma Statistics**
    - Basic Statistics
    - Descriptive Statistics
    - Distributions & Normality
    - Graphical Analysis
  - **Measurement Systems**
    - Precision & Accuracy
    - Bias, Linearity, Stability
    - Gage R & R
    - Variable MSA
    - Attribute MSA
  - **Process Capability**
    - Capability Analysis
    - Concept of Stability
    - Attribute Capability
    - Monitoring Techniques

- **ANALYZE PHASE**
  - **Patterns of Variation**
    - Multi-Vari Analysis
    - Classes of Distributions
  - **Inferential Statistics**
    - Understanding Inference
    - Sampling Techniques
    - Sample Size
    - Central Limit Theorem
  - **Hypothesis Testing**
    - Goals of Hypothesis Tests
    - Statistical Significance
    - Risk: Alpha & Beta
    - Types of Hypothesis Tests
  - **Hypothesis Tests: Normal**
    - 1 Sample t-test
    - 2 Sample t-test
    - 1 Sample Variance
    - One Way ANOVA
    - Test of Equal Variance
    - Normality Tests
    - Sample Size Calcs
  - **Hypo Tests: Non-Normal**
    - Mann-Whitney
    - Kruskal-Wallis
    - Mood's Median
    - Friedman
    - 1 Sample Sign
    - 1 Sample Wilcoxon
    - 1 Proportion
    - 2 Proportion
    - Chi-Squared

- **IMPROVE PHASE**
  - **Simple Linear Regression**
    - Correlation
    - XY Diagram
    - Regression Equations
    - Residuals Analysis
  - **Multiple Regression**
    - Non-Linear Regression
    - Multiple Regression
    - Confidence Intervals
    - Residuals Analysis
    - Data Transformation
    - Stepwise Regression
    - Logistic Regression

Lean Six Sigma Black Belt Curriculum Outline:

- **Designed Experiments**
  - Experiment Objectives
  - Experiment Methods
  - Experiment Considerations
- **Full Factorial Experiments**
  - 2k Full Factorial Designs
  - Linear & Quadratic Models
  - Balanced & Orthogonal Designs
  - Fit, Model & Center Points
- **Fractional Factorial**
  - Designs
  - Confounding Effects
  - Experimental Resolution

- **CONTROL PHASE**
  - **Lean Controls**
    - Control Methods for 5S
    - Kanban
    - Poka-Yoke
  - **SPC**
    - SPC Data Collection
    - Xbar-R Chart
    - Xbar-S Chart
    - U Chart
    - C Chart
    - P Chart
    - NP Chart
    - CuSum Chart
    - EWMA Chart
    - Control Methods
    - Control Chart Anatomy
    - Subgrouping & Sampling
    - Control Limit Calculations
  - **Control Plans**
    - Cost Benefit Analysis
    - Elements of Control Plans
    - Elements of Response Plans