Beyond Z's Lean Six Sigma Curriculum for Green Belts

1.0 Introduction & Define
1.1 The Basics of Six Sigma
1.1.1 Meanings of Six Sigma
1.1.2 General History of Six Sigma & Continuous Improvement
1.1.3 Deliverables of a Lean Six Sigma Project
1.1.4 The Problem Solving Strategy $Y = f(x)$
1.1.5 Voice of the Customer, Business and Employee
1.1.6 Six Sigma Roles & Responsibilities

1.2 The Fundamentals of Six Sigma
1.2.1 Defining a Process
1.2.2 Critical to Quality Characteristics (CTQ's)
1.2.3 Cost of Poor Quality (COPQ)

1.3 Selecting Lean Six Sigma Projects
1.3.1 Building a Business Case & Project Charter
1.3.2 Developing Project Metrics
1.3.3 Financial Evaluation & Benefits Capture

1.4 The Lean Enterprise
1.4.1 Understanding Lean
1.4.2 The History of Lean
1.4.3 Lean & Six Sigma
1.4.4 The Eight Elements of Waste

2.0 Measure
2.1 Process Definition
2.1.1 Cause & Effect Matrix
2.1.2 Process Mapping, SIPOC, Value Stream Map
2.1.3 Failure Modes & Effects Analysis (FMEA)

2.2 Six Sigma Statistics
2.2.1 Basic Statistics
2.2.2 Descriptive Statistics
2.2.3 Normal Distributions & Normality
2.2.4 Quality Tools- Graphical Analysis
      Histogram, Box Plot, Run Chart, Pareto Chart, Scatter Plot

2.3 Measurement System Analysis
2.3.1 Precision & Accuracy
2.3.2 Bias, Linearity & Stability
2.3.3 Gage Repeatability & Reproducibility
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
      a. including DPU, DPMO, FTY, RTY
2.4.4 Monitoring Techniques

2.5 Sampling`
2.5.1 Understanding the need for Sampling
2.5.2 Types of Sampling

3.0 Analyze
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 Central Limit Theorem

3.3 Hypothesis Testing
3.3.1 General Concepts & Goals of Hypothesis Testing
3.3.2 Significance; Practical vs. Statistical
3.3.3 Risk; Alpha & Beta
3.3.4 Types of Hypothesis Test

3.4 Hypothesis Testing with Normal Data
3.4.1 1 & 2 sample t-tests
3.4.2 1 sample variance
3.4.3 One Way ANOVA : a. Including Tests of Equal Variance, Normality Testing and Sample Size calculation, performing tests and interpreting results.

3.5 Hypothesis Testing with Non-Normal Data
3.5.1 Mann-Whitney
3.5.2 Kruskal-Wallis
3.5.3 Mood's Median
3.5.4 Sample Sign
3.5.5 One and Two Sample Proportion
3.5.6 Chi-Squared (Contingency Tables)
a. Including Tests of Equal Variance, Normality Testing and Sample Size calculation, performing tests and interpreting results.

3.6 Regression
3.6.1 Simple Linear Regression
3.6.2 Correlation
3.6.3 Regression Equations
3.6.4 Multiple Regression

3.7 Lean Concepts
3.6.1.Process Flow and Operations
3.6.2 Push vs Pull
3.6.3 FIFO
3.6.4. Standard Work
3.6.5 Takt Time

4.0 Improve
4.1 5S - Sort, Set in order, Shine, Standardize, Sustain

4.2 Lean Tools & Techniques
4.2.1 Cellular Manufacturing
4.2.2 Heijunka
4.2.3 Kanban
4.2.4 Quick Change Over
4.2.5 Jidoka
4.2.6 Kaizen Event
4.2.7 Poka-Yoke (Mistake Proofing)
4.2.8 Total Productive Maintenance

4.3 Pugh Matrix
4.4 Ideation
4.5 Pilot Study

5.0 Control
5.1 Lean Controls
5.1.1 Control Methods for 5S
5.1.2 Kanban
5.1.3 Poka-Yoke (Mistake Proofing)

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 Xbar-S Chart
5.2.8 Control Chart Anatomy