CALDWELL & ASSOCIATES LLC

Caldwell & Associates Course Body of Knowledge

Lean Six Sigma Black Belt Onsite & Virtual Boot Camp Workshop - 5 days - $2,495

Define Phase	Summary List of Green Belt Knowledge - prerequisite
	1.0 Define Phase
	1.1 Lean Six Sigma Green Belt Review
	1.2 Operational Excellence Culture
	1.3 Lean Six Sigma Roles & Responsibilities
	1.4 DMIAC Problem-Solving Approach - Project Charter
	1.5 Voice of the Customer, Business and Employee
	1.6 Cost Benefit Analysis (CBA)
	1.7 Critical to Quality Characteristics (CTQ's)
	1.8 Lean 5S Visual Management Systems to Support Workplace Safety
	1.9 Lean Six Sigma Design for Manufacturing
	1.10 Process Analysis Tools
	1.11 Principles of Product and Service Flow
	1.12 Quality Improvement Approach
	1.12.1 Total Cost of Quality - Cost of Poor Quality
	1.12.2 Root Cause Analysis
	1.12.3 Fishbone Diagrams and 5-Whys
Measure Phase	**2.0 Measure Phase**
	2.1 Basic Statistical Concepts
	2.1.1 Introduction to Discrete Random Variables
	2.1.1.1 Random Variables
	2.1.1.2 Discrete Random Variables
	2.1.1.3 Probability Distribution
	2.1.1.4 Continuous Random Variables
	2.1.1.4.1 Uniform Distribution
	2.1.1.4.2 Student's T Distribution
	2.1.1 Standard Deviation - **Workshop 1 - Variance and Standard Deviation Calculation**
	2.1.2 Histogram and Boxplot - **Workshop 2 - Histogram and Boxplot**
	2.1.3 X-Y Diagram; Scatter Plot - **Workshop 3 - Scatter Plot**
	2.1.4 Pareto Analysis (80:20 rule) - **Workshop 4 - Pareto Anaysis**
	2.1.5 Normal Distribution - **Workshop 5 - Histogram & Workshop 6 - Boxplot**
	2.2 Statistical Process Control (SPC)
	2.2.1 The Western Electric (WECO) Rules
	2.2.2 Individuals-Moving Range (I-MR) Chart - **Workshop 7 & 8 I-MR Chart**
	2.2.3 X-Bar R Control Chart - **Workshop 11 & 12 - X-Bar-R Control Chart; Fitbit Data**
	2.2.4 X-Bar S Control Chart
	2.2.5 p Control Chart
	2.2.6 u Control Chart

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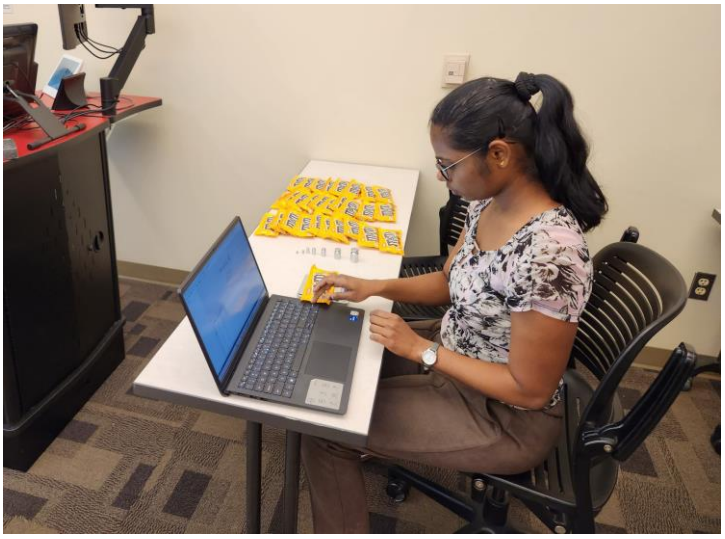
Analyze Phase	**3.0 Analyze Phase**
	3.1 Graphical Analysis
	3.2 Lean Six Sigma Problem-Solving Deep Depth of Analysis
	3.3 Root Cause Data Analysis Approach
	3.4 Process Capability
	3.5 Check for Normality - **Workshop 13 - Check for Normality; Fitbit Data**
	3.6 Statistical Data Analysis with Hypothesis Testing
	3.6.1 One Sample T-Test - **Workshop 14, 16, & 17 - One Sample T-Test**
	3.6.2 Two-Sample T-Test - **Workshop 15 & 18 - Two-Sample T-Test; Fitbit Data**
	3.6.3 Paired T-test - **Workshop 19 - Paired T-Test; Fitbit Data**
	3.6.4 P-Value Definitions - **Workshop 20, 21, 22, & 23 - M&M Sweet Statistics**
	3.6.5 Type I and Type II Errors
	3.7 Measurement System Analysis - **Workshop 24 & 25 Repeatability Study & Gage R&R**
	3.7.1 Gage Repeatability & Reproducibility (Gage R&R) **- Workshop 26 M&M Statistics**
	3.7.2 Capability with Non-Normal Data
	3.7.2.1 Chi-Square Test - **Workshop 27 - Chi-Square Test; M&M Sweet Statistics**
	3.7.2.2 One-Proportion Test - **Workshop 28 & 29 - 1-Proportion Test**

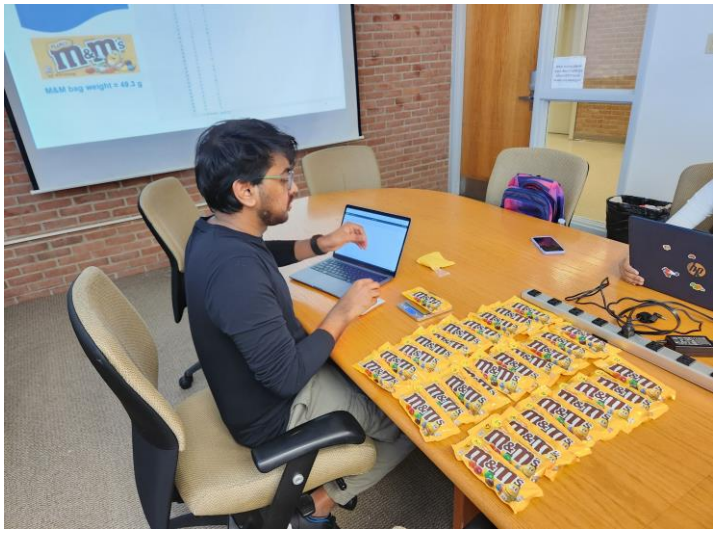
M&M Sweet Statistics Workshop

Interactive Workshop

Only available with onsite training.

- Gage R & R Study
- 1 Sample: T-TEST
- Paired T-TEST
- 1-Proportion Test
- Chi-Square Test





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Improve Phase	**4.0 Improve Phase**
	4.1 Simple Linear Regression
	4.1.1 Correlation
	4.1.2 Regression Equations
	4.1.3 Residuals Analysis
	4.2 Multiple Regression Analysis
	4.2.1 Non- Linear Regression
	4.2.2 Multiple Linear Regression
	4.2.1 Confidence & Prediction Intervals
	4.2.2 Residuals Analysis
	4.2.3 One Way ANOVA
	4.3 Designed Experiments
	4.3.1 Experiment Objectives
	4.3.2 Experimental Methods
	4.3.3 Experiment Design Considerations
	4.4 Full Factorial Experiments
	4.4.1 2k Full Factorial Designs
	4.5 Fractional Factorial Experiments
Control Phase	**5.0 Control Plan**
	5.1 Lean Six Sigma Controls
	5.2 Implement Control Plan
	5.3 Capture Improvement Data
	5.4 Audit Improvements
	5.5 Sustain Improvements
Certification Exam Requirements	Caldwell & Associate Certification Exam included with the course. LSSBB project must be approved.
	You must have a lean six sigma black belt project for certification.
	Lean Six Sigma Master Black Belt Project consulting consultation to completion of the project.

Interactive Workshop

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Lean Six Sigma Catapult Workshop

- **Design of Experiments (DOE)**
- **Multiple Regression Analysis**