



LEAN SIX SIGMA
BLACK BELT COURSE TOPICS
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LEAN SIX SIGMA BLACK BELT

COURSE TOPICS

LESSON	TOPIC
Overview	A top-level overview of the topics covered in this course
What is Six Sigma?	A complete top-level overview
Lean Overview 1	Waste and Value
Lean Overview 2	Value Streams, Flow and Pull
Lean Overview 3	Perfection
Recognizing an Opportunity	Linking your Black Belt activities to the organization's vision and goals
Choosing the Project-Pareto Analysis	How to pick a winning project using Pareto Analysis
Assessing Lean Six Sigma Project Candidates	How to carefully assess Lean Six Sigma project candidates to assure success
Develop the Project Plan 1	Team selection and dynamics; brainstorming; consensus decision making; nominal group technique
Develop the Project Plan 2	Stakeholder analysis, communication and planning, cross functional collaboration, and Force Field Analysis
Develop the Project Plan 3	Obtain a charter for your project
Develop the Project Plan 4	Work breakdown structures, DMAIC tasks, network diagrams
Develop the Project Plan 5	Project schedule management; project budget management
Develop the Project Plan 6	Obstacle avoidance tactics and management support strategies
High Level Maps 1	L-Maps, linking project charter Ys to L-Map processes
High Level Maps 2	Mapping the process from supplier to customer (SIPOC)
High Level Maps 3	Product family matrix



Voice of the Customer (VOC) 1	Kano Model, getting the voice of the customer using the critical incident technique
VOC 2-Survey Development	Using the output of the CIT process to develop and validate surveys
VOC 3-Listening to Customers	Focus groups and other customer listening posts
VOC 4-Analytic Hierarchical Process (AHP)	How to determine customer importance weights
VOC 5-CTQ Specification	Link the voice of the customer to the CTQs that drive it
Principles of Variation 1	How will I measure success? Are my measurements trustworthy? Scales of measurement, data types, measurement error principles.
Principles of Variation 2	Enumerative and analytic studies; statistical process control principles; operational definitions
Establish the Process Baseline 1	Descriptive statistics for measuring distribution location, spread, and shape
Establish the Process Baseline 2	Control charts for location or central tendency: averages, ranges, standard deviations, individual observations, and moving ranges.
Establish the Process Baseline 3	Control charts for discrete data (attributes control charts.) p, np, c and u charts
Establish the Process Baseline 4	Control chart selection and interpretation
Establish the Process Baseline 5	Discrete distribution: Binomial, Poisson, Hypergeometric
Establish the Process Baseline 6	Continuous probability distributions for Lean Six Sigma: normal, exponential, chi-square, Student's t, F
Establish the Process Baseline 7	Process capability analysis
Establish the Process Baseline 8	Rolled throughput yield, normalized yield, process sigma level
Establish the Process Baseline 9	Create detailed pictures of the as-is process
Establish the Process Baseline 10	Spaghetti charts
Establish the Process Baseline 11	Current state value stream map



Test Theories with Data 1	Statistical inference
Stratify Data 1	Data collection and sampling for stratification
Stratify Data 2	Data stratification tools: tree diagrams, Pareto analysis, matrix diagrams, check sheets, defect location maps
Stratify Data 3	Distributions-graphical data summaries. Histograms and frequency plots.
Stratify Data 4	Exploratory Data Analysis (EDA). Box plots, stem-and-leaf plots.
Stratify data 5-CTQ by 2 or more Xs	Multi-Vari Charts
Set Goals for the Outputs 1	Benchmarking as an aid in goal setting
Set Goals for the Outputs 2	Project FMEA
Focus the Problem Statement-Opportunity Maps	Use activity maps to identify value added activities
Design a Lean Value Stream	Lean principles; future state value stream map
Develop Theories 1	Brainstorming, cause-and-effect diagrams (Ishikawa diagrams, fishbone diagrams)
Develop Theories 2	Root cause analysis, event and causal factor tree, fault tree analysis.
Test Theories with Data 2	Testing common assumptions: data type, independence, normality
Test Theories with Data 3	Experimentation concepts and sample size
Test Theories with Data 4	Testing one way classifications: t-tests, ANOM, 1-Way ANOVA, Kruskal-Wallis
Test Theories with Data 5	Two way classification analysis: ANOVA, ANOM
Test Theories with Data 6	Analysis of two-way tables of counts using chi-square
Test Theories with Data 7	Non-parametric testing with Minitab
Model Cause-and-Effect 1	Correlation analysis, scatter plots
Model Cause-and-Effect 2	Regression analysis, linearizing transformations
Model Cause-and-Effect 3	Analysis of residuals from regression analysis
Model Cause-and-Effect 4	Designing and analyzing screening experiments using Minitab



Model Cause-and-Effect 5	Factorial and fractional factorial designed experiments using Minitab
Creating Flow (2 modules)	Select the subproject, identify high-impact variables, design pull systems, design continuous flow work cells, choosing and maintaining equipment, 5S, SMED, etc.
Analysis of Costs and Benefits	Financial analysis including present value, future value, net present value, internal rate of return
Measurement Systems Analysis 1	Analysis of continuous data measurement systems (taught here, but used earlier in actual projects)
Measurement Systems Analysis 2	Analysis of attributes measurement systems
Determine Improvement Strategy 01	Improvement project planning, pilot study, simulation
Determine Improvement Strategy 02	Risk assessment and mitigation using prioritization matrices, FMEA and process decision program charts (PDPC)
Implement 1	Institutionalize your changes
Implement 2	Process control planning, process control principles, choosing the process elements to monitor, approaches to process control, and next steps.
Implement 3	Process deployment maps
Implement 4	Dashboards for process control and improvement
Implement 5	Training needs analysis, continuous improvement with KAIZEN, Kaizen events, extend flow to suppliers and customers, project closure



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