

CBMG LEAN SIX SIGMA GREEN BELT BoK

Unit 1: Introduction to Six Sigma I

- Six Sigma & its Goals
- Six Sigma as a Performance Measure, Problem Solving Tool, & Management Philosophy
- Problem Solving Tools Used in Six Sigma & its Evolution
- Variation and Significance
- Critical-To-Quality Measures & Specification Limits
- Definition & Understanding of Defects & Defect Opportunities
- Source of Defects - Variation & Off-Centered

Unit 2: Introduction to Six Sigma II

- DPMO, DPM, Sigma Scores and Percentages
- Lean, Goals of Lean & Lean Six Sigma
- Six Sigma Problem Solving Methodologies
- Six Sigma Tool Kit & Business Process Management Model

Unit 3: Six Sigma Problem Solving

- Business Problem and Six Sigma Project & its Sources
- Generic Model & Approach to Business Problem Solving
- Logic and Intuition, Just do It, DMAIC, & DFSS - IDOV
- Selecting the Right Problem Solving Method
- Need & Criteria for Project Selection
- Project Selection tools - Pareto Diagram, & Project Selection Matrix
- DMAIC Project Roadmap & Characteristics of Problem Solving
- Project Tools, Tollgate Review & Project Durations

Unit 4: Six Sigma Roles & Responsibilities

- Roles & Responsibilities
- Yellow, Green, Black, & Master Black Belt
- Champion / Process Owner & Deployment Champion
- Certification Criteria to be a Yellow Belt, Green Belt, Black Belt & Master Black Belt
- Career Chances: Six Sigma Professionals
- Types of Certification & ASQ/IASSC Certification Criteria

Unit 5: Listening to Customer

- Customer - Internal & External
- Voice of Customer (VOC) & Need for Voice of Customer
- Verbatim & Verbatim to Requirements
- Gather VOCs - Direct & Indirect Method
- Methods of Gathering VOC & Analyse VOC
- Definition & Procedure for Affinity Diagram
- Customer Priorities & Kano Model
- Customer Requirements - Must-Be's, Delighters, One Dimensional
- Quality Function Deployment
- Importance & When to use QFD

Unit 6: Define - Completing a Project Charter

- Definition & Elements of Project Charter
- Business Case & Problem Statement
- Measure of Success of a Project
- Primary and Secondary Metrics
- Goal Statement
- Team Members & Roles
- Project Benefits, Translation Plan, & Project Duration Guidelines

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- Project Kick-off & Weekly Meetings
- Need for Project Scoping, Project Scoping & Tools
- Procedure to use In Frame / Out Frame

Unit 7: Define - Process Mapping Tools

- Process Mapping Tools, its Purpose, & Types
- Definition & Purpose of SIPOC, Cross-Functional Process Maps, Process Flowchart, Standard Operating Procedure
- Procedure of SIPOC & Cross-Functional Process Map
- X-Y Diagram
- Process States - As-is, Should-be & To-be
- Value to customer & Definition & Purpose of Process Value Analysis
- Value Added, Non-Value Added & Value Enabling Activities
- Important Terms & Procedure of Process Value Analysis

Unit 8: Measure - Cause & Effect Relationships

- Cause & Effect, Types of Causes - Possible, Potential, & Root Causes
- Cause & Effect Diagram, Structure, Purpose, Benefits & Procedure of Cause & Effect Diagram
- 5 Why & Performing 5 Why
- Construct a Cause & Effect Matrix & interpret it
- Root Cause Analysis - Practical, Graphical and Analytical.

Unit 9: Measure - Data Types

- Data Collection Roadmap
- Types of Data - Attribute, Variable & Locational Data
- Comparison & Conversion between Variable & Attribute Data
- Types of Measurement Scales - Nominal, Ordinal, Interval, & Ratio Scale

Unit 10: Measure - Data Sampling

- Need & Applications of Data Sampling
- Sampling Strategy & Approach for Sampling Plan
- Population & Process Sampling
- Sample Size Computation & Need
- Computing Discrete & Continuous Data Sample Size

Unit 11: Measure - Data Collection

- Data Collection Roadmap
- Data Collection Plan, Template
- Data Collection Methods

Unit 13: Measure - Intro to Business Statistics II

- Probability Distribution, Types, & Importance
- Multi - Vari Analysis
- Measures of Central Tendency - Mean, Median, Mode
- Relationship between Mean Median & Mode
- Measures of Dispersion - Range, Span, Variance, Standard Deviation
- Types of Descriptive Statistics - Graphical, Numerical
- Application & Properties of a Normal Distribution
- Outlier, Confidence Limits, Confidence Level & Confidence Intervals
- Definition of Central Limit Theorem & its relevance

Unit 14: Measure - Graphical Methods

- Interpretation, & Procedure of Histogram
- Interpretation, & Procedure of Box Plot
- Skewness & Kurtosis
- Normality Test & its Procedure
- Stem-and-Leaf Plot, Run Charts, Scatter Plots

- Run Chart Patterns & Interpretation
- Interpretation of Scatter Plots - Direction, Shape, & Strength of Relationship

Unit 15: Measure - Assessing Capability & Performance

- Measures of Current Performance - Process Capability, Process Capability Study & Indices
- Traditional Measures - C_p , C_{pk} & C_{pm} & their Acceptable Limits
- Sigma Capability, Computation of Sigma Scores & Z Tables
- Long Term Vs Short Term & Long Term Indices

Unit 16: Analyze - Theory of Hypothesis Testing

- Hypothesis - Introduction
- Hypothesis Statements - Null & Alternative Hypothesis
- Significance Levels, & Alpha Values
- Tests of Significance - Statistical & Practical Significance
- Test Statistic & P Value & Its Interpretation
- Errors in Hypothesis Testing & Types of Errors

Unit 17: Analyze - Performing Hypothesis Test

- Hypothesis Tests for Means, Variance, Proportions
- Selection of Hypothesis Tests & Criteria for Selection
- Z-Test, Z-statistic, & Assumptions
- t-Test, t-Statistic, 1-t Test & 2-t Test, & Assumptions
- Paired Data - Paired t-Test, Preparation & Procedure
- ANOVA & F-test, Assumptions, Preparation & Procedure
- Mann-Whitney
- Kruskal - Wallis
- Mood's Median
- Friedman
- 1 Sample Sign
- 1 Sample Wilcoxon
- Chi-square Test & Statistic, Assumptions, Preparation & Procedure
- Proportions Test - 1-p Test & 2-p Test, Assumptions, Preparation & Procedure

Unit 18: Analyze - Correlation & Regression

- Correlation, Regression, Scatter Plots, & Correlation Coefficient
- Residuals Analysis
- Non- Linear Regression
- Confidence & Prediction Intervals
- Residuals Analysis
- Data Transformation, Box Cox
- Procedure of Simple Linear Correlation & Interpretation of Scatter Plots
- Application of Regression & its Types
- Regression Line of Fit, Regression Equation, & its Statistical Significance
- R-SQ Value & Procedure of Simple Regression
- Prioritization of Causes, & Pareto Principle and Procedure for Pareto Chart
- Procedure of Control-Impact Matrix

Unit 19: Improve - Lean Management Systems

- Origin, Principles & Goals of Lean
- Value, Value Stream, Concept of Muda (Waste) & Categories of Waste
- 7 Types of Wastes, How to Identify them, & Waste Identification Template
- Value Stream Mapping (VSM), Symbols, Benefits & Procedure
- Push System, Pull System, Single Piece Flow, 5S, Kaizen, SMED, Poka-Yoke
- Types of Poka-Yoke - Shut Down, Prevention, Warning, Instructions
- Heijunka & Visual Control

Unit 20: Improve - Generating & Screening Solutions

- Approach to Solution Generation, Definition, & Types of Lateral Thinking
- Edward De Bono, Definition & Concept of Random Stimulus
- Brainstorming - Unstructured, & Structured Brainstorming
- Brainstorming Principles & Types
- Solution Screening Techniques, Need, Approach, & Filtering Techniques
- N/3 Voting & Procedure, Pay Off Matrix & Procedure, Criteria Based Matrix (CBM) & Procedure, Pugh Matrix & Procedure

Unit 21: Improve - Failure Mode Effects Analysis

- Managing Six Sigma Process Risks
- Failure Modes, Effects, Cause, Current Controls
- Prioritizing Risks, Definition of Risk Priority Number & Calculation
- Risk Mitigation Strategies & Application of FMEA
- Definition of DFMEA

Unit 21: Control - Control Plan

- Process Control, Role of Process Control in 6σ projects & in Control Phase
- Process Control Plan, Control Parameters, Method of Control
- Reaction Plan & Procedure
- Statistical Process Control (SPC), History, & its Application
- CumSum Chart
- EWMA Chart
- Purpose, Selection & Interpretation of Control Charts
- Control Limits, Normal Distribution, Specification Limits
- Stability Tests & Guidelines for Stability Tests
- Solutions Implementation & Statistical Validation of Improvements
- Post-Improvement Capability Analysis, Project Documentation & Benefits
- Project Closure & Translation Plan