

**Six Sigma Green Belt**

**Course Number:** SIX-104
**Duration:** 8 days

**Overview**

This Six Sigma Green Belt training course takes attendees from white to green belt, covering the entire DMAIC (Define, Measure, Analyze, Improve, and Control) methodology incorporating Minitab Statistical Software.  Globally recognized [certification for Lean Six Sigma Green Belt](https://www.sixsigmacouncil.org/lean-six-sigma-green-belt-certification-standard/) is achieved by applying the [DMAIC roadmap](https://www.isixsigma.com/dmaic-methodology/six-sigma-dmaic-roadmap/) to improving an organization's process. Remote coaching by the Master Black Belt instructor is included through the initial project completion and certification (up to 3 hours of support).

Note: This Green Belt course is conducted over two 4-day sessions (8 full training days in all) of training with a 3-4 week break between sessions.

**Prerequisites**

No experience is presumed, however, the ability to apply [DMAIC roadmap](https://www.isixsigma.com/dmaic-methodology/six-sigma-dmaic-roadmap/) on a process improvement project in the attendee's work environment is required for certification.

**Materials**

All Six Sigma training students receive comprehensive courseware.

**Software Needed on Each Student PC**

[Minitab](https://www.minitab.com/en-us/products/minitab/free-trial/) (attendees can download the free 30-day trial).

**Objectives**

* Understand the DMAIC roadmap
* Define the problem, the process associated with the problem, metrics for measuring success, and the business value of the project
* Define a support structure and its roles and responsibilities
* Establish an existing process flow
* Apply the cause and effects matrix
* Identify high-risk relationships to help mitigate the risk of failure
* Understand how the properties of the normal distribution are linked to the concept of variability
* Analyze data with Minitab software
* Use graphical and analytical techniques to conduct basic data analysis
* Understand the general types of variability
* Interpret a standard Control Chart
* Construct and complete a Measurement Systems Analysis (MSA) for various measurement situations
* Understand the natural variation of the process

**Outline**

* Lean Six Sigma Overview
	+ A brief history of both Lean and Six Sigma process improvement methodologies
	+ The process improvement structure
	+ The DMAIC roadmap
	+ Inefficiency and ineffectiveness of processes that are linked to the Lean Six Sigma methodology
* Defining Phase and Project Selection
	+ Definition, scoping, and selection
	+ Defining projects
	+ Defining the problem
		- The Process associated with the Problem
		- Metrics for measuring success
		- The business value of the project
* Six Sigma Organizational Deployment
	+ Defining a support structure with various roles and responsibilities
		- The attributes of the various roles
		- Expectations of each role
		- Success factors for effectively completing meaningful projects
* Process Variables Mapping
	+ Establishing the existing process flow and the steps involved in the process
	+ The contributing factors to the process performance
	+ Determining the root cause of the variability in the baseline process
	+ Not a standard “flowchart”
* Cause and Effects Matrix
	+ Establishing the factors to address based on their relationships to the process performance measures
* Failure Mode and Effects Analysis (FMEA)
	+ An in-depth view of the top-ranked factors to determine if they are susceptible to failure
	+ Establishing high-risk environments
	+ Mitigating the risk of failure
* Types of Waste
	+ Various types of waste
	+ How to identify wastes
	+ Methods that can be taken to reduce waste
* Basic Statistics
	+ Using statistical approaches to solve the underlying performance problems
	+ Methods for describing data statistically
		- Shape, center, and spread of the data distribution
	+ Normal distribution properties
* Introduction to Statistical Software functions
	+ Basic functions, structure, and capabilities
* Basic Quality Tools
	+ The graphical and analytical techniques used to conduct basic analysis
	+ Analyzing data sets and searching for root causes of variability
		- Dotplot
		- Histogram
		- Normal probability plot
		- Time Series plot
		- Pareto diagrams
		- Fishbone diagram
		- Boxplots
		- Scatter plots
		- Descriptive statistics
* Introduction to Statistical Process Control
	+ Identifying key events contributing to the variability of the process to set the direction for process improvement
		- General types of variability
	+ Normal distribution to time series data
	+ Interpreting a standard control chart
* Measurement Systems Evaluation
	+ Using data to determine the root causes of process performance variability.
	+ Constructing and completing a Measurement Systems Analysis (MSA) for various measurement situations
* Introduction to Capability Studies
	+ Natural variation
	+ Determining how the process performs in comparison to the customer expectations (specifications)
	+ Short- and long-term variability
* Multi-Vari Studies
	+ The root cause of the variability
	+ Key elements for designing and conducting a successful passive data collection study
	+ Graphical analysis techniques for prioritizing which factors to investigate with advanced analytical methods
* Hypothesis Testing
	+ Designing and properly analyzing the various types of hypothesis tests is essential for making well informed decisions.
	+ Risk levels for decision errors
	+ Determining the proper test to utilize and threats to the practical significance of the evaluation may exist
* Comparing Groups: One Way ANOVA
	+ Use the roadmap for conducting a test and for evaluating the various underlying assumptions affecting the method including the Test for Equal Variances
	+ Correlation and Regression Analysis
	+ Establishing the relationship between two continuous type variables can be accomplished through use of correlation.
	+ Evaluating the causal relationship using basic Linear Regression techniques and their use in developing a prediction equation
* Chi-Square Test: Proportion Comparisons
	+ Testing the proportions of various groups to establish if there is an unusual relationship that exists
* Multi-Vari Case Study
	+ Applying the various Multi-Vari Study data analysis techniques
	+ The decision process based on information provided using a simulation tool
* Introduction to Designed Experiments (DOE)
	+ The applicability, concepts, methods for designing and analyzing simple designed experiments
	+ Insights into tools expanded upon in the Black Belt level training course.
* Mistake Proofing
	+ Methods to prevent factors from varying uncontrollably through the use of Mistake Proofing methods
* Process Control Plans
	+ Transfer understanding to the process owners and to establish ‘the formula’ for future predictable process performance.
* Project Documentation
	+ Providing a history of the methods, assumptions, analysis, and decisions made throughout the process
	+ Establish the final impact and value of the project on the business.
* Conclusion