



# Six Sigma Green Belt

100 hours

## Course Overview/Description

This Six Sigma Green Belt Online Training Program encompasses all aspects of running a Six Sigma Green Belt business, including management, service delivery, design, production, and customer satisfaction. Six Sigma is one of the highest standards for companies and individuals to achieve. This interactive online program provides the training you need to master these highly valuable skills.

Six Sigma is a quality improvement methodology structured to reduce product or service failure rates to a negligible level (roughly 3.4 failures per million opportunities). Six Sigma companies typically spend less than five percent of their revenues addressing and repairing quality problems.

To achieve these levels, the Six Sigma process encompasses all aspects of a business, including management, service delivery, design, production, and customer satisfaction. As a philosophy, Six Sigma drives business culture and requires a nearly flawless execution of key processes, making Six Sigma a high standard for companies and individuals to achieve. By reducing process variation, Six Sigma frees an organization to focus on improving process capability. As sigma levels increase, the cost of poor quality decreases and profitability increases. This is why Six Sigma is highly associated with the delivery of consistent, world-class quality.

The Six Sigma Green Belt Online Training Program provides you with an overview of the Six Sigma concepts and tools, including Six Sigma deployment practices, project development, and the DMAIC problem-solving approach. Once you've completed this program, you'll be ready to successfully participate in a Six Sigma team.

All materials are included. Upon registering, you're given an initial six months to complete the program. Should you need more time, you may request a six-month extension at no additional charge.

*"The training helped me understand that Six Sigma and Lean complement each other... The whole process was outstanding. It has brought a better understanding of statistics and how Six Sigma applies to processes."*

--- S.J. Reno (Spring 2005)

## Course Objectives

By completing this program, you'll be able to:

- Recognize key attributes of a successful Six Sigma program
- Appreciate project selection criteria
- Realize the role of a Green Belt in the Six Sigma organization
- Understand fundamentals of the DMAIC problem-solving methodology
- Use basic Six Sigma tools for Six Sigma project definition and process baseline
- Understand the need for advanced problem-solving and improvement methodologies used by project teams
- Actively participate in a Six Sigma team

## Course Outline

### **I. Why Six Sigma?**

- a. Definition and Graphical View of Six Sigma
- b. Comparisons Between typical TQM and Six Sigma Programs
- c. Origins and Success Stories

### **II. How to Deploy Six Sigma**

- a. Leadership Responsibilities
- b. Description of the Roles and Responsibilities
- c. Resource Allocation
- d. Data-driven Decision Making
- e. Organizational Metrics and Dashboards

### **III. DEFINE: Project Definition**

- a. Tasks
- b. Work Breakdown Structure
- c. Pareto Diagrams
- d. Process Maps
- e. Matrix Diagrams
- f. Project Charters
- g. Reporting

### **IV. DEFINE: Project Scheduling**

- a. Activity Network Diagram
- b. PERT Analysis
- c. GANNT Chart

### **V. DEFINE: Change Management/Teams**

- a. Problems with Change
- b. Achieving Buy-in
- c. Team Formation, Rules, and Responsibility

- i. Stages of Team Development
  - ii. Overcoming Problems
- d. Consensus Building
  - i. Affinity Diagram
  - ii. Nominal Group Technique
  - iii. Prioritization Matrix

#### **VI. MEASURE: Tools and Objectives**

- a. Measure Stage Objectives
- b. Flowcharts
- c. Process Maps
- d. SIPOC
- e. Box-Whisker Plots
- f. Cause and Effect Diagrams
- g. Check Sheets
- h. Interrelationship Diagram
- i. Stem and Leaf Plots

#### **VII. MEASURE: Establishing Process Baseline**

- a. Enumerative vs. Analytic Statistics
- b. Process Variation
- c. Benefits of Control Charts
- d. Requirements vs. Control
- e. Control Chart Interpretation

#### **VIII. MEASURE: X-Bar Charts**

- a. Uses
- b. Construction and Calculations
- c. Assumptions
- d. Rational Subgroups
- e. Sampling Considerations
- f. Interpretation

#### **IX. MEASURE: Individuals Data**

- a. Uses
- b. Construction and Calculations
- c. Assumptions
- d. Sampling Considerations
- e. Interpretation
- f. Overview of Other Individuals Charts

- i. Run Charts
- ii. Moving Average Charts
- iii. EWMA Charts

**X. MEASURE: Process Capability**

- a. Histograms
- b. Probability Plots
- c. Goodness of Fit Tests
- d. Capability and Performance Indices
  - i. Relative to Process Control
  - ii. Interpretation
  - iii. Estimating Error

**XI. MEASURE: Attribute Charts**

- a. Uses
- b. Selection
- c. Construction and Calculations
- d. Sampling and Considerations

**XII. ANALYZE: Introduction to Regression Analysis**

- a. Scatter Diagrams
- b. Linear Model
- c. Interpreting the ANOVA Table
- d. Confidence and Prediction Limits
- e. Residuals Analysis
- f. Overview of Multiple Regression Tools

**XIII. ANALYZE: Lean Thinking**

- a. Definition of Waste
- b. Analyzing Processes for NVA
  - i. Cycle Efficiencies
  - ii. Lead Time and Velocity
- c. Methods to Increase Velocity
  - i. Standardization
  - ii. Optimization
  - iii. Spaghetti Diagrams
  - iv. 5S
  - v. Level Loading
  - vi. Flow
  - vii. Setup Reductions

**XIV. IMPROVE: Tools and Objectives**

- a. Improve Stage Objectives
- b. Tools to Prioritize Improvement Opportunities

- c. Tools to Define New Process Flow
  - i. Lean Tools to Reduce NVA and Achieve Flow
- d. Tools to Define and Mitigate Failure Modes
  - ii. PDPC
  - iii. FMECA
  - iv. Preventing Failures
- e. Reference to Tools for Defining New Process Levels

#### **XV. CONTROL: Tools and Objectives**

- a. Control Stage Objectives
- b. Control Plans
- c. Training
- d. Measuring Improvement

#### **Prerequisites/Audience**

To take this program, you should have a general understanding of basic mathematical functions, the reading comprehension level of a high-school graduate, and general proficiency in using Windows-based computer software.

This training is for you if you want to learn the fundamental skills necessary to contribute to a Six Sigma team as a Green Belt. In addition, Six Sigma Champions, who sponsor projects, will also benefit from this understanding of the Six Sigma project methodology.

Green Belts are chosen for Six Sigma project teams based on their process knowledge. They work as part of a team assigned to a given project, maintaining their operational roles in the organization.

#### **PC Requirements/Materials**

This program is compatible with the Windows Vista operating system.

To access this program and study guide, you'll need a Web-enabled computer.

Adobe Flash Player and Adobe Acrobat Reader are required for this program.

Go to <http://get.adobe.com/reader/> to download the Acrobat Reader.

Go to <http://get.adobe.com/flashplayer/> to download the Flash Player.



This program includes the following materials for a complete learning experience:

- Six Sigma Demystified by Paul Keller
- Six Sigma Handbook by Thomas Pyzdek
- Green Belt Notebook

**Note:** The Green Belt XL software is not compatible with Mac computers. Although the vast majority of tools included in the Green Belt XL software function in both 32 bit and 64 bit Windows environments, a few of the less relevant tools are limited to use in 32 bit operating systems.

### **Instructor Bio**

**Paul Keller**, Vice President, is a Senior Consultant with Quality America, Inc.. Paul has developed and implemented successful Six Sigma and Quality Improvement programs in service and manufacturing environments. Paul has been with Quality America since 1992, where he has:

- Developed and managed systems for overall operations, including quality improvement, product development, partner relations, marketing, sales, order fulfillment and technical support.
- Provided primary statistical expertise to our customer base, as well as internal Software Development, Sales and Technical Support teams.
- Developed and implemented Six Sigma related courses, including Quality Management, Statistical Process Control (SPC), and Designed Experiments, to hundreds of our companies in a wide variety of industries including Roche Pharmaceuticals, Core3 Inc. Business Process Outsourcing, US Army, MacDermid Printing Solutions, Boeing Satellite, Dow Corning, Antec, Pfizer, Warner Lambert, and many others.

Paul has authored a number of well-received publications, including:

- 2009: Co-authored 3rd edition Six Sigma Handbook, New York: McGraw Hill.
- 2005: Author Six Sigma Demystified, New York: McGraw Hill. (Over 35,000 copies sold to date).
- 2003: Technical Editor Quality Engineering Handbook, Tucson: QA Publishing, LLC.
- 2002: Contributing Author Manufacturing Handbook of Best Practices, Boca Raton: St. Lucie Press.
- 2001: Author *Six Sigma Deployment*, Tucson: QA Publishing, LLC.



- 2001: Co-author Six Sigma Study Guide, Tucson: QA Publishing, LLC.
- 2000: Contributing Author Handbook for Quality Technicians and Mechanical Inspectors, Tucson: QA Publishing, LLC.
- 2000: Contributing Author Handbook for Quality Management, Tucson: QA Publishing, LLC.
- 1992-present: Numerous articles in professional trade magazines, conference proceedings, and Quality America's Knowledge Center.

Before launching Quality America's training and consulting business in 1992, Paul specialized in Quality Engineering in the Masters Program at the University of Arizona. He applied these techniques as a Quality Manager for a consumer goods manufacturer (1990-1992), and an SPC Director at an industrial products manufacturer (1987-1990). In these roles, he developed company-wide Quality Systems to meet the demands of a diverse customer base, including the automotive and aerospace industries.

Paul is currently active in Six Sigma training and consulting through Quality America and Gatlin Education.