EXCELSIOR COLLEGE

7 Columbia Circle, Albany, NY 12203-5159
Phone: **518.608.8211** | Toll Free: **888.647.2388** | Fax: 518.464.8777
WWW.EXCELSIOR.EDU/CPD

CENTER FOR PROFESSIONAL DEVELOPMENT

SIX SIGMA GREEN BELT

100 Hours/12 Months/Instructor-Facilitated
Course Code: **CPD119**

OVERVIEW

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.

OBJECTIVES

By completing the program, you will:

- 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

OUTLINE

1. **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

2. **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

3. **DEFINE: Project Definition**
    a. Tasks
    b. Work Breakdown Structure
    c. Pareto Diagrams
    d. Process Maps
    e. Matrix Diagrams
    f. Project Charters
    g. Reporting

4. **DEFINE: Project Scheduling**
    a. Activity Network Diagram
    b. PERT Analysis
    c. GANNT Chart

5. **DEFINE: Change Management/Teams**
    a. Problems With Change
    b. Achieving Buy-in
    c. Team Formation, Rules, and Responsibilities
        i. Stages of Team Development
        ii. Overcoming Problems
    d. Consensus Building
        i. Affinity Diagram
        ii. Nominal Group Technique
        iii. Prioritization Matrix

6. **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

7. **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

8. **MEASURE: X-Bar Charts**

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

9. 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

10. 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

11. MEASURE: Attribute Charts

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

12. 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

13. ANALYZE: Lean Thinking

a. Definition of Waste
b. Analyzing Process 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

14. 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
    i. PDPC
    ii. FMECA
    iii. Preventing Failures
e. Reference to Tools for Defining New Process Levels

15. CONTROL: Tools and Objectives

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

MATERIALS INCLUDED

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

COMPUTER REQUIREMENTS

- PC (Windows XP/Vista/7) – the Green Belt XL software is not compatible with Mac
- Excel 2003, 2007, or 2010
- Internet connection (high-speed recommended)
- Adobe Flash Player and Adobe Acrobat Reader

INSTRUCTOR BIO

Paul Keller is a Senior Consultant with Quality America, Inc. where he 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.