

<b>Course Name:</b>	<b>Lean Six Sigma Black Belt Certification</b>
<b>Instructor:</b>	Ahmed Ayad (Certified Master Black Belt Trainer)
<b>Propose Dates:</b>	Starting on Aug 19th-20 <sup>th</sup> 2017 (future dates TBD)
<b>Location:</b>	Wesleyan satellite campus (4426 S Miami Blvd, Durham, NC 27703)
<b>Cost:</b>	\$3,000/ per student includes Minitab software access

### Course Objective:

The objective of this course is to provide a detailed understanding of the five phases in the Lean Six Sigma methodology that include Define, Measure, Analyze, Improve and Control. The Black Belt course also provides advanced training in statistical analysis using Minitab, project management tools, problem solving techniques, and a thorough understanding of change leadership.

### Course Description:

The Lean Six Sigma Black Belt course at Wesleyan College is a comprehensive program that works to expand a student's knowledge and understanding of continuous improvement. Six days of facilitated classroom teaching is used to demonstrate and practice tools and skills which the student then immediately applies to a real world improvement project. Sessions are fast paced and timed to synchronize with a typical project life cycle. Throughout the Lean Six Sigma Black Belt program, the student will receive coaching and mentoring, both as part of the classroom group and individually, to maximize the student's success. Upon completion of the class, project and a final exam the student will become a **certified Black Belt**, able to address larger and more complex projects. The course also includes three team exercise simulations as well as relevant industry standard case studies to reinforce the concepts of Lean Six Sigma.

### REQUIREMENTS

- Students must identify a project that is a significant and viable improvement opportunity. Tools and skills developed in the class will be applied to the project to demonstrate a student's learning.
- Experience with continuous improvement tools and approaches, including Lean Six Sigma. (Green Belt experience is highly recommended.)
- Flexibility and drive to deliver results. A key component of the class is the student delivering a completed project while receiving ongoing support and coaching from the instructor.

## Learning Objectives:

The aim of this course is to qualify and certify that a candidate is trained to:

- Work with and understand customer requirements
- Enhance the capability of processes to exceed customer expectations
- Identify projects and select project team members
- Work with sponsors to develop a Six Sigma deployment strategy
- Act as an internal consultant
- Implement successful Lean Six Sigma projects
- Train/mentor/coach Green Belts and project teams
- Act as a catalyst for process improvement
- Provide teams with ongoing support and leadership
- Report and effectively communicate to a project sponsor
- Understand when and how to use Six Sigma tools
- Provide feedback to management
- Master presentation skills for executive audiences

## COURSE CONTENT : 6 days

### **Six Sigma Black Belt Certification**

#### **Day 1**

- Overview of Six Sigma
- History and background of Lean Six Sigma
- DMAIC Methodology Overview
- Financial Benefits of Six Sigma
- The Impact of Six Sigma to the organization
- Six Sigma Language
- Change Management
- Change Leadership

#### **Define**

- Lean vs Six Sigma
- Project Definition
- Project Charter
- Developing a Business Case
- Chartering a Team
- Defining Roles and Responsibilities
- Problem Statement Development
- Gathering Voice of the Customer, Support for Project
- Translating Customer Needs into Specific Requirements (CTQs)
- SIPOC Diagram
- Pareto Analysis
- Define Phase Review

## Day 2

### Measure

- Process Mapping (As-Is Process)
- Data Attributes (Continuous Versus Discrete)
- Defining Metrics
- Measurement System Analysis
- Gage Repeatability and Reproducibility
- Data Collection Techniques
- Calculating Sample Size
- Control Chart Theory
- Data Collection Plan
- Understanding Variation
- Measuring Process Capability
- Calculating Process Sigma Level
- Rolled Throughput Yield
- Visually Displaying Baseline Performance
- Statistical Software Training
- Measurement Phase Review
- Team Simulation

## Day 3 & Day 4

### Analyze

- Visually Displaying Data (Histogram, Run Chart, Pareto Chart, Scatter Diagram)
- Detailed (Lower Level) Process Mapping of Critical Areas
- Value-Added Analysis
- Cause and Effect Analysis (a.k.a. Fishbone, Ishikawa)
- Affinity Diagram
- Data Segmentation and Stratification
- Correlation and Regression (Linear, Multiple)
- Process Performance (Cp, CpK, Pp, PpK, CpM)
- Short Term Versus Long Term Capability
- Non-Normal Data Distribution Transformations
- Central Limit Theorem
- Goodness of Fit Testing
- Hypothesis Testing
- Analysis of Variance (ANOVA), Two Sample T-Tests, Chi Squared Test
- Design of Experiments (DOE) – Full, Fractional Factorials
- Verification of Root Causes
- Team Simulation
- Determining Opportunity (Defects and Financial) for Improvement
- Project Charter Review and Revision
- Statistical Software Training in Minitab version 17
- Analyze Phase Review

## Day 5

### Improve

- Brainstorming
- Multi-Voting
- Process Simulation
- Quality Function Deployment (House of Quality)
- Selecting a Solution
- Failure Modes and Effects Analysis (FMEA)
- Poka Yoke (Mistake Proofing Your New Process)
- Piloting Your Solution
- Implementation Planning
- Statistical Software Training
- Culture Modification Planning For Your Organization
- Team Simulation
- Improve Phase Review

## Day 6

### Control

- Assessing The Results of Process Improvement
- Statistical Process Control (SPC)
- Rational Subgrouping
- Establishing Process Standards for Inputs, Process and Outputs
- Developing a Process Control Plan
- Documenting the Process
- Statistical Software Training
- Control Phase Review
- Exam