

# **Lean Six Sigma - Green Belt – (2 Week Program)**

## **Course Description:**

This 2-week course will be customized to the Client's processes to assure optimal relevance.

This course is designed to provide the student with an understanding of the **Lean Sigma DMAIC methodology** for improving critical processes to achieve measureable business impact and customer value. Key principles and tool usage constitute the core of this approach, as real projects are used with a proven "hands-on" approach that results in measureable real world process improvements.

## **Course Format:**

2 x 1 week courses, each of 5 days class-room training focusing not on PowerPoint slides, but on hands-on usage of the thought process maps and tools necessary to improve key processes.

The course follows the **DMAIC (Define-Measure-Analyze-Improve-Control)** methodology, introducing relevant methods and tools to and prepares the student for completing their project with their identified coach / mentor.

**Week 1** provides the foundational methods, tools and techniques, and launches the first continuous improvement projects.

**Week 2** follows approximately 4 weeks after the end of week 1 and provides the next level of methods, tools and techniques, as well as continued support of first continuous improvement projects.

## **Attendee Profile:**

- Process Owners who want to learn how to continuously improve their process efficiency and capacity, cost, and reduce compliance risk.
- Professionals identified as Green Belt Candidates for their functional area
- Process Owners' management who want to learn how to manage in a process centric environment.
- IT Professionals who want to learn about the business processes and how they can enable better process management and business results
- Compliance professionals who want to learn how processes can be improved to meet increasingly more stringent compliance requirements
- Quality professionals who want to learn how processes can be improved to meet tighter quality requirements

## **Prerequisites:**

- Completion of NJM's Business Process Improvement / "White Belt" Course
- Completion of the "What is Lean Six Sigma?", George, Rowlands, Kastle
- Review of "The Lean Enterprise Memory Jogger", Richard L. MacInnes
- Basic Microsoft Excel and PowerPoint skills
- Basic Project Management skills

## **Course Goals:**

This course is designed to provide the student with an understanding of the Lean Sigma DMAIC methodology for improving critical processes to achieve measureable business impact and Customer value. Key principles and tool usage are the core of this approach, as real projects are used in a proven “hands-on” approach the result in real world business results.

## **Course Outline:**

### **Week 1:**

#### **Day 1:**

- Introduction to Lean Six Sigma and Course Overview
  - Including roles descriptions
- DMAIC methodology
- Project Reviews
- Voice of the Customer:
  - Collection Methods, Critical Customer Requirements Trees
- Voice of the Process
- SIPOC
- Charters
- Business Case development
- Process Mapping

#### **Day 2:**

- Data Collection Methods
- Tools:
  - Pareto charts, histograms, run charts, basic SPC charts
- Lean Measurements, Value of Speed
- Process Metrics and Dashboards
- Improvement (Kaizen) Events: Planning and Execution

#### **Day 3:**

- Survey of Basic Analysis
- Root Cause Analysis Methods
- Lean Tools overview
  - 5S, FMEA, Forms of Waste, Value Add/Non-Value Add/Business Value Add concepts
- Solutions Generation and Prioritization
- Solution Piloting and Implementation Planning

#### **Day 4:**

- Mistake Proofing and FMEA
- Control Plans and Tools
- Hand-off
- Project Closure

#### **Day 5:**

- Teach backs
- Project Reviews
- Test and Feedback
- Close

## **Week 2**

### **Day 1:**

- Review of Week 1: Define
- MSA (Measurement System Analysis)
- Lean Concepts
- Workflow Process Mapping / Value Stream Mapping

### **Day 2:**

- Analyze:
  - Review the As-is process map, pain points
  - Takt Time
  - Risk Analysis / FMEA for improvement opportunities
  - Process Cycle Efficiency
  - NVA/VA Analysis, charts
  - Root Causes, review C&E diagram (Ishikawa), brainstorming
  - Analyzing the data:
  - Graphical techniques
  - Confidence intervals
  - Hypothesis testing
  - Verifying Root Causes: Regression Analysis, Correlation

### **Day 3:**

- Improve:
- Generating solutions:
  - Brainstorming
  - Benchmarking
  - Lean process flow techniques
  - Balancing
  - Other Lean Methods
- Selecting the best solutions:
- Prioritization
- Benefit & Effort review
- Piloting
  - Baseline vs. Pilot gap analysis

### **Day 4:**

- Control:
- Standardizing the solution
- SPC II
- Process performance metrics and dashboard
- SOPs, training plan
- Quantifying the improvement
- Capability
- SPC
- Close Project

### **Day 5:**

- Advanced topics:
- Design for Six Sigma
- Quality by Design
- Quality Function Deployment
- Mistake Proofing
- Portfolio Building
- Process Management
- Understanding Variation / Components of Variation
- Applied Logistic Regression
- DMADV/DMEDI
- Additional Analysis tools

## **Appendix A: Typical Green Belt Exercise Flow – Specific Industry Example**

## **Overview of Exercise Flow**

Students will be provided information for their projects that they will build through the course. The exercises will utilize material covered in the training modules to build a complete DMAIC improvement project.

- **Introduction:** The case study concept will be presented to the students and provide an overview of the approach and objective.

### **Define:**

- Thought process mapping: students are to prepare the project framework in a thought process map format, to be used throughout the week to track their progress in their project.
- Chartering: Student is to develop project Problem Statements, the foundation of the project scope and objectives.
- Voice of the Customer / Voice of the Business: Students will develop their data collection plans, and learn how to convert wants / needs to Critical Customer Requirements.
- Financial Benefits: Student will complete the Financial Benefits statements, and other benefits statements
- Charter: Student will update the project Problem Statement, Objectives and finalize the Charter, and the concept of "living charter" will be presented. The initial outline of the project plan is included in his exercise.
- SIPOC: The student will document their process at the high level with the SIPOC.
- Gaining Acceptance: Student will prepare a stakeholder analysis and communication plan for the project.
- Improvement Event: Students will decide on whether or not to hold a focused improvement event (Kaizen) for their project, and begin planning for it, if needed.
- Detailed Project Planning: The plan will be completed in detail, include identification of dependencies and resources.
- Stage Gate 1 or Define Stage Gate: Student will prepare a Stage Gate 1 for presentation to the Sponsor and Key Stakeholders.

### **Measure:**

- Student will prepare a Stage Gate 1 for presentation to the Sponsor and Key Stakeholders spaghetti diagrams, Swim Lanes, and others.
- Data Collection: Student will prepare a process map and a data collection plan.
- Data presentation: Student will prepare a histogram and Pareto Chart of the data collected. Optional: Sigma calculation
- Stage Gate 2 or Measure Stage Gate: Student will update their charter, and prepare a Stage Gate 2 presentation to the Sponsor and Key Stakeholders.

### **Analyze:**

- Root Cause Analysis: The Student will prepare a root cause analysis using one or more methods presented in the material, including Cause & Effect Diagrams, 5-Why, or others. A Pareto Chart will be prepared to identify higher opportunities.
- Benefit-Effort: The Student will build a simple B-E Matrix for their project, defining the 2 relevant scales, and present a prioritized order of root causes on which to focus improvement solutions brainstorming.
- Stage Gate 3 or Analyze Stage Gate: Student will update their charter, and prepare a Stage Gate 3 presentation to the Sponsor and Key Stakeholders.

### Improve:

- Solutions Generation: The Student will use various creativity techniques to generate potential solutions to their project, such as brainstorming-affinity method.
- Solutions Selection: The Student will use Solutions Selection technique to prioritize those solutions that are easiest to implement and have the largest improvement impact per their project objectives.
- Solutions Implementation: The student will develop their pilot plan, which includes the data collection plan, and decision criteria, and then the possible implementation project plan. The solutions are to be applied to the As-is process maps, including the SIPOC and the Swim Lanes to yield the To-be process maps.
- Failure Modes and Effects Analysis: The student will complete the FMEA and the risk mitigation plan for their project.
- Stage Gate 4 or Improve Stage Gate: Student will update their charter, and prepare and present a Stage Gate 4 presentation to the Sponsor and Key Stakeholders.

### Control

- Control Plan: The Student will complete the Control Plan for their project, as well as outline SOP changes needed as well as the Training Plan.
- Visual Work Place: The Student will complete their Visual Work Place for their project.
- Stage Gate 5 or Control Stage Gate: Student will update their charter, and prepare and present to validate that improvement were sustained.