

# Green Belt Virtual Agenda

with Virtual Capstone

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## GREEN BELT

### E-Learning Courses

Time

### Virtual Class

Time

#### Session 1 - Introduction

April 25, 2017 6:00PM-8:00PM MDT

Lean Six Sigma will focus improvement efforts to drive significant improvements in speed, quality and profitability. The methods and tools of lean will drive improvements in speed and productivity. The methods and tools of six sigma will drive improvements in defects and variation. Lean Six Sigma projects follow a Define - Measure - Analyze - Improve - Control methodology which has been proven to work well in all business operations including operation, administrative and service.

#### Learning Objectives - the participant will:

Understand and define the quality philosophies of Six Sigma and Lean.  
Identify benefits and objectives of Lean Six Sigma.  
Be able to outline the Lean Six Sigma implementation process.  
Understand the project requirements and the basics of selecting and defining a project.

#### Tools, Templates, Forms

Process Sigma calculator,  
DMAIC Roadmap  
Glossary

#### Prerequisite E-Learning

min.

Six Sigma Introduction	60
Introduction to Lean Principles*	60
Introduction to Lean Office and Service*	45
<b>Total hrs.</b>	<b>2.75</b>

#### Virtual class topics

Introduction to Lean Six Sigma and DMAIC  
Methodology  
Project Management Basics

#### Homework

Identify value streams in your process (15 min)

2.0

0.3

Approximate time required (hrs.) 5

#### Session 2 - Defining the Project

May 4, 2017 5:30PM-7:30PM MDT

Understanding process requirements is all about understanding the Voice of the Customer (VOC) and the Voice of the Business. The central philosophy of Lean Six Sigma is to measure process performance from the perspective of the customer whether internal or external. The **Define Phase** involves preparing a project charter, understanding the relationships between Suppliers-Inputs-Process-Outputs-Customer (SIPOC), translating voice of the customer into Critical-To-Quality (CTQ) requirements which are important to the customer, and developing a project charter.

#### Learning Objectives - the participant will:

Translate customer needs to critical-to-quality metrics.  
Apply Dr. Kano's 4 beliefs to identifying customers requirements.  
Be able to identify gaps surrounding a process.  
Understand the project requirements and the basics of selecting and defining a project.  
Create a project charter.  
Show how the use of Kaizen Events, or Rapid Improvement Events, speeds up the execution of larger initiatives.  
Learn the application, use, and interpretation of several types of process maps.  
Have an understanding of the five focusing steps of the Theory of Constraints.

#### Tools, Templates, Forms

Project Charter  
Gantt Chart  
Kano Analysis  
Stakeholder Analysis  
CTx Matrix  
SIPOC Diagram

#### Prerequisite E-Learning

min.

Voice of the Customer	75
Managing the Project	55
Kaizen Event*	30
SIPOC	15
Mapping the Process	30
Introduction to the Theory of Constraints	55
<b>Total hrs.</b>	<b>4.3</b>

#### Virtual class topics

Project Charter  
Kaizen Event  
Voice of the Customer and CTX's  
SIPOC Diagram  
Process Mapping

#### Homework

Develop a SIPOC diagram for a process of your choice

1.5

0.5

Approximate time required (hrs.) 6.3

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## Session 3 - Measuring the Process

May 9, 2017 5:30PM-7:30PM MDT

The **Measure Phase** presents tools and techniques which allow the team to refine the problem and begin the search for root causes. In this session the participants will learn tools for measuring a process from a lean perspective by identifying and measuring waste in a process, and from a six sigma perspective by measuring variation. Basic statistical tools will be presented so each participant will need to have a copy of statistical software (Minitab) for data analysis.

### Learning Objectives - the participant will:

Describe why Eight Wastes are a primary focus area during Lean implementation.  
Construct a current state VSM.  
Know how to calculate and evaluate takt time vs. cycle time.  
Be able to identify and describe value add vs. non value add activities.  
Understand basic statistical terms and definitions.  
Understand the concept of variation and sources of variation in data.  
Learn the application of several graphical techniques for plotting and presenting data.

### Tools, Templates, Forms

Value Stream Map  
Capacity Model  
DPMO and Sigma Level  
Frequency distributions  
Histogram  
Dot Plot  
Excel Files for exercises

### Prerequisite E-Learning

	min.
Eight Wastes*	25
Current State Value Stream Mapping*	60
Future State Value Stream Mapping*	45
Process-Based Costs	30
What is Statistics?	35
Organizing and Presenting Data	45
<b>Total hrs.</b>	<b>4.0</b>

### Virtual class topics

Eight Wastes  
Value Stream Mapping  
Calculating Process Based Costs  
Introduction to Minitab  
What is Statistics?  
Organizing and Presenting Data

Total hrs. 2.0

0.5

Approximate time required (hrs.) 6.5

### Homework

Basic statistics exercises using Minitab

## Session 4 - Process Analysis

May 23, 2017 5:30PM-7:30PM MDT

Descriptive statistics focus on the collection, analysis, presentation and description of a set of data. The Measure Phase focuses on understanding the current performance of the process selected for improvement and collecting any necessary data needed for analysis. It includes assessment of the measurement systems to ensure data validity.

### Learning Objectives - the participant will:

Define the central limit theorem and understand its significance and use.  
Identify, calculate, and interpret the measures of central tendency - mean, median and mode.  
Use the characteristics of the normal curve to calculate Z scores and percentiles.  
Know how to apply a Gauge R&R study to validate the measurement system.  
Use an Attribute Agreement Analysis to determine the validity of attribute measurement systems.

### Tools, Templates, Forms

Pareto Diagram  
Scatter Plot  
Descriptive Statistics  
Gauge R&R Study  
Attribute Agreement Analysis

### Prerequisite E-Learning

	min.
Pareto Analysis	40
Scatter Diagrams	30
Measures of Central Tendency	40
Measures of Dispersion	60
Measurement System Analysis	45
5S*	30
<b>Total hrs.</b>	<b>4.1</b>

### Virtual class topics

Data and Graphical Analysis  
Validating the Measurement System

2.0

0.5

Approximate time required (hrs.) 6.6

### Homework

Basic statistics exercises using Minitab

## Session 5 - Baseline and Root Cause

May 30, 2017 5:30PM-7:30PM MDT

The measure phase concludes with the MDTablishment of the process baseline. A process capability study will provide information about the performance of the process under specified operating conditions and the data will provide a basis for improvements in later phases. In the Analyze Phase the team will examine the processes, data, and facts to gain an understanding of why problems occur and what improvement opportunities exist.

### Learning Objectives - the participant will:

Conduct process capability studies for variable and attribute data and interpret the results.  
Be able to identify improvement objectives give the performance capability.  
Use Failure Mode and Effect Analysis as a risk assessment tool.  
Understand the cause and effect principle.  
Identify, apply and analyze several root cause analysis tools.  
Understand how visual management works with 5S as a key building block for lean improvements.

### Tools, Templates, Forms

Process Capability  
5 Why's  
Ishikawa Fishbone Diagram  
CE Matrix  
Root Cause Analysis  
Current Reality Tree  
Process FMEA  
Visual Management Techniques  
Error Proofing (Poke Yoke) Devices

### Prerequisite E-Learning

	min.
Introduction to Process Capability	45
Process Capability Assessments	60
Cause and Effect Diagrams	40
Failure Mode and Effects Analysis	30
Visual Management*	20
Error Proofing*	20
<b>Total hrs.</b>	<b>3.6</b>

### Virtual class topics

Process Capability  
Cause and Effect Diagrams  
Failure Mode and Effects Analysis  
5S  
Visual Management  
Error Proofing

2.0

1.0

Approximate time required (hrs.) 6.6

### Homework

Construct a simple Current reality Tree from a fishbone diagram

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## Session 6 - Making Improvements

June , 2017 5:30PM-7:30PM MDT

When the data collection and analysis is completed and the team determines that additional analysis will not add to their understanding of the problem, it's time to move on to the **Improve Phase** and solution development. Lean tools and techniques will provide several improvement opportunities for eliminating waste and streamlining the process.

### Learning Objectives - the participant will:

Describe the primary benefits gained from Total Productive Maintenance.  
 Use Overall Equipment Effectiveness (OEE) to assess the health of the process.  
 Know how to create effective Workplace Design for office and manufacturing processes.  
 Explain how Changeover Reduction it supports and enables Lean waste reduction.  
 Provide a step--by--step guide to implementing a successful Changeover Reduction program.  
 Know how to create, implement, and improve Standard Work for both office and manufacturing processes.  
 Understand where to implement Pull Systems know how they enable effective flow of information and materials,  
 Identify which pull system tools are bMDT suited for various office and manufacturing environments.

### Tools, Templates, Forms

OEE Worksheet  
 Visual Displays, Controls  
 Error Proofing Devices  
 Changeover Analysis  
 Kanban

### Prerequisite E-Learning

	min.
Total Productive Maintenance	25
Workplace Design and Layout*	20
Changeover Reduction	60
Standard Work*	20
Flow and Pull Systems	30
<b>Total hrs.</b>	<b>2.6</b>

### Virtual class topics

Total Productive Maintenance	
Workplace Design and Layout	
Changeover Reduction	
Standard Work	
Flow and Pull Systems	
<b>Total hrs.</b>	<b>2.0</b>

### Homework

none

0.0

Approximate time required (hrs.) 4.6

## Session 7 - Controlling the Process

June 12, 2017 5:30PM-7:30PM MDT

The team has been collecting improvement ideas throughout the project and it time to apply a structure approach to evaluating and selecting solutions. Once the solution has resulted in measurable improvement it is time to move to the Control Phase. this phase focuses on creating and sustaining the improvement but MDTablshing process monitors and controls.

### Learning Objectives - the participant will:

Discuss how potential savings affect a project's Return On InvMDTment (or ROI).  
 Describe the purpose and application of common tools used to generate and analyze potential solutions and to assess risk.  
 Explain how all these components come together in the implementation plan.  
 Explain how to identify which Control Chart type is most appropriate for monitoring a given process parameter.  
 Construct and interpret control charts for variables and attributes.  
 Describe the key components required for effectively closing the project, including documentation, handoff, and leverage.  
 Design a Control Plan, discuss its importance, and explain how to create and implement it.

### Tools, Templates, Forms

Solution Selection Matrix  
 Pugh Matrix  
 Implementation Plan  
 Control charts for variable data  
 Control charts for attribute data  
 Control Plan

### Prerequisite E-Learning

	min.
Selecting the Solution	30
Control Charts	45
Controlling the Process	45
<b>Total hrs.</b>	<b>2.0</b>

### Virtual class topics

Selecting the Solution	
Control Charts	
Controlling the Process	
<b>Total hrs.</b>	<b>1.5</b>

### Homework

none

0.0

Approximate time required (hrs.) 3.5

	hrs.
ONLINE	23.3
VIRTUAL CLASS	14.0
VIRTUAL CAPSTONE	0.0
<b>TOTAL HOURS</b>	<b>37.3</b>

OPTIONAL HOMEWORK	2.8
<b>Total</b>	<b>40.1</b>