

#### Course Syllabus Lean Six Sigma Green Belt

(Topic list, sequence, etc., subject to revision-note: if this Syllabus is revised, already past class meetings may not be updated in the corresponding past Modules)

(for a week-by-week breakdown and latest, updated information, see the "Modules" section - accessed via the "Modules" link to the left.)

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Office Hours: Mondays at 8:30 AM by appointment

#### **Program Overview**

Self-Paced Course. Office hours to be scheduled.

#### Learning Objectives & Expected Outcomes

- Gain a strong working knowledge of Lean Six Sigma with the intention of practical application of the methodology and tools at work.
- Participants will have a strong foundation in the use of Lean, Six Sigma, the DMAIC methodology and the technical tools and soft skills used in leading or co-leading a Green Belt-level structured improvement activity, i.e., a Lean Six Sigma project or kaizen event.
- A sustainable, improved process providing financial and/or operational and/or customer service benefits, and a process that incrementally improves workflow for employees.
- Professional development: experience and confidence gained, so that new Green Belt can repeat his/her success in future projects.
- This is a 1-credit course

**Projects:** LN SIX SIGMAGREEN-2 will provide a simulated project for you to complete for an additional 1-credit. After completing LN SIX SIGMAGREEN-2, you may contact Corey Therrien at <u>corey.therrien@rutgers.edu</u> to sign up for for a Green Belt Certification. The certification is an additional \$1,000 fee and includes a LSS Personal Learning Coach as a project mentor for a real-life project.

# **Program Materials**

All required materials will be available electronically through both email and variously throughout the modules with links to external sites, readings or other resources.

## **High-Level Topic Outline\***

\*Depending on the pace and progress of the class during each live, online session, some topics may be covered earlier or later in the program than listed here.

# Note: "Week #" refers to the date of that week's (or Module's) online class meeting.

# Week 1

- Introductions
- Ground Rules
- Course Requirements, Process, Timeline
- GB's with and without projects: Differences
- Individual project mentoring/Sharing project progress
- How to maintain confidentiality: Information shared by various organizations
- How are the weekly sessions organized?
- Class Breakout Sessions and Homework Exercises
- Software: Minitab/Excel, iGrafx/Visio, PowerPoint
- Technology: How to maximize effective use of Zoom
- Form Breakout Teams (Learning Partners)
- Breakout Teams: Determine who will play/win Superbowl and discuss
- Lean Six Sigma Overview
- Assess learners' familiarity with Lean Six Sigma
- Homework Review: Learners share process improvement opportunities in their area of work (pre-homework)

#### New learning

- The Cost of Poor Quality (COPQ) Poor quality hurts everyone
- List COPQ examples with internal, external, appraisal, and quality improvement costs

#### Week 2

- Homework Review
- New Learning
- Why Lean Six Sigma?
- Lean and Six Sigma-2 Methodologies blended into 1
- Voice Of the Customer (VOC) -Since the customer comes first, find out from your customer what they want.
- Identify internal/external/other customers, define expectations of each customer
- Lean Concepts and Tools
- SIPOC
- Standard Work

### Week 3

- Homework Review
- Lean Concepts and Tools (Continued)
- o The 8 Wastes of Lean-Recognizing Waste so we can eliminate it
- 6S A place for everything and everything in its place
- Spaghetti Diagram/Gemba Walk How to untangle wasted motion
- Process Maps A view of who does what and when it's done

## Week 4

- Homework Review
- Lean Concepts and Tools (cont'd), Six Sigma Concepts and Tools
- Value Stream Maps (VSM)-Uncovering the bottlenecks & opportunities for improvements
- Root Cause Analysis Getting to the root cause of the problem
- Mistake-Proofing How to prevent mistakes from happening
- $\circ$   $\,$  Kaizen and Continuous Improvement How to plan a successful event
- DMAIC- A Process Improvement Methodology

- What is DMAIC?
- The Five phases of DMAIC
- o Team Roles
- Project Selection
- Project Charter

# Week 5

- Homework Review
- Six Sigma Concepts and Tools
- Data Numerical Facts
- Measurement System Analysis (MSA) Are we measuring correctly and consistently?
- Basic Statistics-How to interpret and understand data
- Graphical Analysis
- Pareto Chart-The 80/20 Rule
- Time Series Plots and Run Charts- Displaying data in time sequence
- Scatter Plots- Displays relationship between two variables
- Introduction to Inferential Statistics- Drawing conclusions about a whole population based on a sample
- Process Capability and Sigma Quality Levels-Is your process Good enough?

## Week 6

- Homework Review
- Statistical Process Control (SPC) Monitoring your process to keep it on track
- Other Useful Tool
- Project Scheduling Tools
- Control Plan & Validation-follow-up actions that sustain improvements.
- PICK Chart-Which Problem Should we Solve First?
- FMEA- What are the risks in implementing our process improvements?
- Takt Time-Production Time to meet customer demand

## Week 7

- Homework review
- Review of all sessions
- Test preview

• Review project completion and Green Belt Certification path forward actions

### Learning Format

Throughout the program, you will work both independently and collaboratively in a virtual environment. The hallmark of this program is applied learning, so you can expect each module to be highly participative, involving a combination of real-time and asynchronous learning and activity.

#### Netiquette:

Interactions in a virtual community can feel different from face-to-face communications. The following guidelines should be followed in the threaded discussions and your email communications in order to facilitate a positive and productive learning experience and build a respectful community of learners:

In all of your interactions, remember there is a person behind image or written post.

Be careful with humor and sarcasm. Because the visual cues are absent, many people cannot tell if your comments are meant seriously or facetiously.

Contribute to a meaningful discussion by presenting your "best self" in the course environment.

Take the time to explain your ideas respectfully and completely. However, also keep brevity in mind. You want to make your point clearly, but also make it concisely.

If a peer misinterprets your meaning, acknowledge this without being rude or defensive. It can be challenging to communicate some ideas in writing. This is your opportunity to practice clarifying your ideas to others.

## Academic Integrity:

As an academic community dedicated to the creation, dissemination, and application of knowledge, Rutgers University is committed to fostering an intellectual and ethical environment based on the principles of academic integrity. Academic integrity is essential to the success of the University's educational and research missions, and violations of academic integrity constitute serious offenses against the entire academic community. This academic integrity policy is designed to guide students as they prepare assignments, take examinations, and perform the work necessary to complete their degree requirements.

## The principles of academic integrity require that a student:

- Properly acknowledge and cite all use of the ideas, results, or words of others.
- Properly acknowledge all contributors to a given piece of work.
- Make sure that all work submitted as his or her own in a course or other academic activity is produced without the aid of unsanctioned materials or unsanctioned collaboration.
- Obtain all data or results by ethical means and report them accurately without suppressing any results inconsistent with his or her interpretation or conclusions.
- Treat all other students in an ethical manner, respecting their integrity and right to pursue their educational goals without interference. This requires that a student neither facilitate academic dishonesty by others nor obstruct their academic progress.
- Uphold the canons of the ethical or professional code of his or her profession.

#### Adherence to these principles is necessary in order to ensure that:

- Everyone is given proper credit for his or her ideas, words, results, and other scholarly accomplishments.
- All student work is fairly evaluated, and no student has an inappropriate advantage over others.
- The academic and ethical development of all students is fostered.
- The reputation of the University for integrity in its teaching, research, and scholarship is maintained and enhanced.
- Failure to uphold these principles of academic integrity threatens both the reputation of the University and the value of the degrees awarded to its students. Every member of the University community therefore bears a responsibility for ensuring that the highest standards of academic integrity are upheld.