

**Program Syllabus**



**Program Rationale:** Today,

more than ever before, organizations of all types are questing for top and bottom line improvement. This journey is no longer considered a side-bar activity; rather, it is now viewed as a critical business imperative. Of course, this means that business executives must find new and innovative ways to reduce their total cost structure, improve capability and increase capacity, but done so without capital investment.

These executives also understand that, to achieve this mission, they must improve their core processes, yet done so in an economical, repeatable and verifiable way.

Naturally, the realization of this grand vision requires process improvement leaders – individuals that have the capability to yield beneficial change in a relatively short period of time. When leaders of this caliber are enabled by the power of Lean Six Sigma, quantum business improvements are not only possible, but highly probable.

Hence, we have the compelling need to develop and disseminate competency-based, process-centric training that can support the rapid deployment and effective implementation of Lean Six Sigma know-how. To this end, the Six Sigma Management Institute offers online competency-based *Lean Six Sigma (LSS)* training programs, where each program is delivered through the proven MindPro® learning system.



**Program Introduction:** In its

purest form, Lean Six Sigma is about leveraging the principles and tools of science to abate business risk – at all levels of an enterprise. With this in mind, we can view the practice of Lean Six Sigma (LSS) from four different altitudes.

At its highest level, LSS is a strategic vision that epitomizes business success. Second, it is a tactical system of project management that optimizes the control function of a commercial or industrial enterprise. Third, it is a scientific approach for minimizing or eliminating certain forms of business risk commonly associated with the operation of critical processes. Fourth, it is a personal way of thinking that unites the power of deductive reasoning with the benefits commonly associated with data-driven decision making.



**Core Competencies:**

A Lean Six Sigma competency is simply a standardized set of related knowledge, skills, and abilities that are essential to create and sustain processes improvements, regardless of process type or output volume. From this perspective, the core competencies commonly associated with the Lean Six Sigma Body-of-Knowledge (LSS-BOK) are as follows:

- ✦ Define process-centric problems
- ✦ Measure critical process outputs and inputs
- ✦ Analyze process performance data
- ✦ Improve existing process conditions
- ✦ Control critical process outputs and inputs

Of course, the required scope and depth to which each competency must be practiced is largely dependent upon an individual's contributory role within the organization. For example, a Black Belt's LSS-BOK is generally more comprehensive and technical than that of a Green Belt, Yellow Belt or White Belt. In this sense, the reach of a Black Belt is broader and deeper than that of other types of LSS practitioners.

Of course, each of the related MindPro® training programs (and certification process) has been carefully designed to develop and reinforce each of the aforementioned competencies, as well as continually emphasize their intrinsic value.



**Program Description:** The Lean

Six Sigma Black Belt Program-of-Study is intended to develop technical leaders that are capable of propelling their respective organizations toward best-in-class status by reducing costs, improving cycle times, eliminating defects, eliminating variation and significantly increasing customer satisfaction.

Black Belts are highly trained practitioners who possess the technical knowledge and skills that are necessary to facilitate breakthrough improvements in key processes that support the overall business aims and operational goals of an enterprise. In summary, Black Belts are individual contributors or front line managers that:

- ✦ Serve as change agents, internal consultants, mentor to Green Belts and assistant Six Sigma Champions.
- ✦ Optimize existing technology, or bring new technologies on line at optimal operating conditions.
- ✦ Practice the art and science of solving process-centric problems through the analysis of performance data.
- ✦ Implement technical and leadership capability to improve the performance of an existing industrial or commercial process, regardless of complexity or output volume.
- ✦ Solve specific process-oriented or design-centric problems that have a negative impact on customer satisfaction, operational capability, output capacity, cycle time and other performance-related metrics.

**Program Goals:** Upon completion of this program of study, the candidate will be able to successfully:

- ✦ Master the Six Sigma DMAIC methodology and the related set of analytical tools
- ✦ Apply the Lean Six Sigma knowledge and skills to successfully lead project teams
- ✦ Implement the DMAIC methodology and tools to accomplish Black Belt level projects
- ✦ Utilize the principles and practices of Lean Six Sigma to better frame and solve daily problems
- ✦ Improve business value for the customer and provider in a concurrent and synergistic way.

**Program Focus:** The Black Belt program of study will focus on several key areas:

- ✦ Six Sigma principles, practices, deployment strategies and implementation tactics
- ✦ Lean principles, practices and implementation tactics
- ✦ Descriptive statistics, benchmarking methods, process control techniques, process diagnostic methods and experimental design methods
- ✦ Types and uses of performance data, sample size determination and sampling schemes
- ✦ Project selection criteria, charter elements, execution milestones and review guidelines
- ✦ Principles and practices associated with process characterization and optimization.

Participants of this certification program will execute a digital training project contained within MindPro®. Following formal training, the simulated project provides each candidate with the opportunity to exercise all the key tools and methods, yet done so in the context of a life-like DMAIC project.

In this way, candidates are able to practice their new skills in a controlled environment and then be evaluated on their efforts prior to being made responsible for the execution of a live on-the-job value-centric project.

**Target Audience:** This program of study has been designed for individual contributors and managers seeking vertical mobility or pursuing horizontal opportunities within their respective fields of practice. The successful candidate enjoys working with data and solving problems, as well as working in a project-based, team-oriented environment.



**Program Outline:** The body of

knowledge associated with this program-of-study is organized into three primary segments; namely, *Global Concepts*, *General Practices* and *Technical Practices*. In terms of structure, each program segment is comprised of core topics. In turn, the topics are defined by competency-based training modules, where each module is comprised of instructional steps. Segment and topic titles are as follows:

### Global Concepts

- Training Orientation
- Breakthrough Vision
- Business Principles
- Process Management
- Installation Guidelines
- Application Projects

### General Practices

- Value Focus
- Lean Practices
- Quality Tools
- Basic Statistics
- Continuous Capability
- Discrete Capability

### Technical Practices

- Hypothesis Testing
- Confidence Intervals
- Control Methods
- Parametric Methods
- Chi-Square Methods
- Survey Methods
- Nonparametric Methods
- Experimental Methods
- DFSS Methods
- Measurement Analysis
- Training Project

**Training Prerequisites:** Basic arithmetic skills are essential (i.e., be able to perform addition, subtraction, multiplication, division and work with fractions and decimals). Basic computer skills are also essential. In this context, a rudimentary understanding of Excel is highly recommended, but not essential. Furthermore, a most rudimentary understanding of algebra is a plus, but not required. Generally speaking, the successful completion of any undergraduate degree program will likely support the academic demands of this program. A readiness assessment is freely offered at [www.mindprotesting.com](http://www.mindprotesting.com).



### Instructor Profile: Dr. Mikel J.

Harry is the co-creator of Six Sigma and has been widely recognized and cited in many publications as the principal architect of Six Sigma and the world's leading authority within this field. His book entitled *Six Sigma: The Management Strategy Revolutionizing the World's Top Corporations* has been on the best seller list of the Wall Street Journal, Business Week, and Amazon.com.

Dr. Harry has been a consultant to many of the world's top CEOs and has been a featured guest on such television programs as the NBC show *Power Lunch*. In addition, he has been distinguished by Arizona State University with the 2002 Engineering Excellence Award for superb achievements in the engineering profession and notable contributions to society. At the present time, Dr. Harry is the Chairman of the Six Sigma Management Institute.



### Program Schedule:

The total instructional time for the Black Belt program is approximately 160 hours. The actual task-time will vary, depending on the selected delivery system. If a candidate is pursuing an independent self-paced program of study (via MindPro<sup>®</sup>), the recommended schedule is 2 hours per day. At this rate of progress, the typical candidate will have completed the formal training in 4 months. If the candidate is training through their organization, the assigned program schedule may be established by the local instructor or facilitator.

**Program Orientation:** The MindPro<sup>®</sup> learning system is extremely easy to use and includes a complete tutorial. The tutorial provides a fully illustrated discussion on how to get started using the key features and functionality associated with MindPro<sup>®</sup> and the Black Belt program of study. Of course, the candidate can gain many insights into the MindPro<sup>®</sup> system and its many features by simply exploring the Black Belt syllabus.



### Getting Started:

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Logging into the MindPro® system is quite simple. Just enter a Group ID and Email address and then go to the tab entitled Training Programs. Once there, click on a program title (e.g., Black Belt) and then select a *Topic* and *Module*. Once at the module level, the instructional steps (i.e., videos) will be revealed. To launch a video, simply click on the related icon.



### Instructional Methods:

All of the MindPro® programs of study are delivered through video-based instruction. The *Instruction* videos present Dr. Harry's 5 minute lectures in progressive order, while the *Expansion* and *Application* videos extend the lectures through real-world examples, animations and simulations using Excel and analytical software:

- ✦ **Instruction Video:** Provides lecture type knowledge, utilizing over-the-experts-shoulder-style instruction
- ✦ **Expansion Video:** Builds upon what was learned in the instruction videos by using animations, simulations and examples to expand the content's scope and depth.
- ✦ **Application Video:** Demonstrates how the central ideas can be put to practical use through Excel and Minitab or JMP.

**Delivery Platforms:** The overall MindPro® system is defined by four (4) primary delivery platforms:

- ✦ **Coach:** Filtered database search capability
- ✦ **Search:** Keyword search capability
- ✦ **Resources:** analytics and documents
- ✦ **Programs:** Executable training programs

**Learning Resources:** A wide array of calculators, simulators and reference documents can be readily accessed from within the MindPro® system. As a tool to support independent self-directed learning, there are many resources within MindPro® that can be called upon to augment the overall learning experience.

**Computer Simulations:** The MindPro® process simulators (and DOE simulator) can be used to generate life-like data for a single dependent variable and eight independent variables. Once activated, the simulated data can then be copied to clipboard and easily transferred to Minitab (or another spreadsheet) for subsequent analysis.

The process simulator has enormous flexibility and a wide range of instructional applications. At several points within the MindPro Body-of-Knowledge, the Process Simulator is used by Dr. Harry to demonstrate how various tools should be executed and properly interpreted.

Of course, the candidate can emulate these demonstrations to further the instructional content.

**Digital Coaching:** MindPro™ contains a built-in digital coach that Black Belt candidates can immediately access during the course of their training (or use back on the job).

Essentially, the coach contains three databases that can be independently filtered using an array of input criteria. The output provides a Google-like return that displays one or more coaching packets for the candidate's consumption. In this sense, each coaching packet constitutes a mini-curriculum.

The videos and documents provided within the coaching packets are presented in their native learning. Also included are all of the associated reference documents. Of interest, the coach can also be effectively used in conjunction with the MindPro® key-word search feature.

**Web Links:** MindPro® offers a number of web links to information that can assist the candidate during the course of training, as well as back on-the-job. For example, there are links to process improvement resources such as professional glossaries, best practices and many other handy reference tools.

**Analytical Software:** Although analytical software (Minitab/JMP) is not required to successfully complete any MindPro® program, the candidate should be aware that analytical software (as well as Excel) is used as the primary foundation for demonstrating many of the key tools and concepts described in the MindPro™ Lean Six Sigma Training.

In other words, Minitab or JMP and Excel are used to demonstrate concepts and are used in the Application Videos associated with the MindPro™ Black Belt certification program.

**Reference Books:** The following resources are highly recommended for the Black Belt Program of Study. Although not required, the candidate will find these books most helpful as a *source reference* during the course of training.

Harry, M.J., P. S. Mann, O. C. De Hodgins, R. L. Hulbert, C. J. Lacke (2010) *Practitioner's Guide to Statistics and Lean Six Sigma for Process Improvements*, Wiley, Hoboken, New Jersey (ISBN-13: 978-0470114940)

Harry, M. J., D. Linsemann(2005) *The Six Sigma Fieldbook: How to Successfully Implement the Six Sigma Breakthrough Management Strategy*. Doubleday, Random House Inc., New York (ISBN-13: 978-0385504669)

Harry, M. J., R. Schroeder (1999) *Six Sigma: The Breakthrough Management Strategy Revolutionizing the World's Top Corporations*. Doubleday, Random House Inc., New York (ISBN-13: 978-8129117731)

Pyzdek T, P. Keller (2014) *The Six Sigma Handbook*, Fourth Edition McGraw-Hill, New York (ISBN-13: 978-0071840538)



**Exercises and Quizzes:**

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MindPro® knowledge portal offers topic-level exercises. These learning tools are located within the *Resource* platform. Each exercise and quiz has been specifically designed to support one or more aspects of the related instructional content. The exercises are optional.



**Evaluation System:** After

completing each instructional topic, the candidate can access the related *Topic Knowledge Exam* at [www.mindprotesting.com](http://www.mindprotesting.com). **Minimum** score for each Topic Knowledge Exam is 70%, where the candidate is provided 3 attempts for each exam.

After successfully completing all of the Topic Knowledge Exams, the candidate is then officially recognized as *Black Belt Program Qualified*. The related certificate is granted and signed by Dr. Mikel J. Harry.

Upon successful program qualification, the candidate may proceed to the *Digital Project*

**Exam.** This particular exam can be readily accessed at [www.mindprotesting.com](http://www.mindprotesting.com). Minimum score for the Digital Project Exam is 70%, where the candidate is provided 3 attempts.

After successfully completing the Digital Project Exam, the candidate is officially recognized as *Black Belt Project Qualified*. The related certificate is granted and signed by Dr. Mikel J. Harry.

**Proficiency Certification:** The topic level exams are required for Black Belt *Program Qualification*. The Digital Project Exam is required for *Project Qualification*. Thus, Proficiency Certification = Program Qualification + Project Qualification.

**Academic Integrity:** The faculty and staff of the Six Sigma Management Institute fully support the concepts and conventions related to academic integrity. At all times, candidates are expected to perform their own work in an original way.

- ✦ Having a tutor or colleague complete a candidate's assignments is unacceptable.
- ✦ Having a reviewer make extensive revisions to an assignment or participate during the course of examinations is unacceptable.
- ✦ Use work previously submitted by another candidate or author is unacceptable.
- ✦ Using other's information without proper citation or expressed permission is unacceptable.

Should a candidate choose to violate these basic expectations, the result will be program expulsion. This means that further access to MindPro® will be immediately terminated, pending notification and appeal.

If the violation is discovered following completion of the candidate's training program, then any qualification letters or proficiency certificates that were previously granted by SSMI will be immediately recanted, pending notification and appeal.

At the discretion of SSMI, work accomplished in the Black Belt program of study is subject to verification of originality.

**System Requirements:** The minimum system requirements for all of the MindPro™

Lean Six Sigma Black Belt programs of study are as follows:

- ✦ Pentium processor-based PC or compatible computer
- ✦ 128MB of RAM (256MB recommended)
- ✦ High-Speed Internet Connection
- ✦ Cookies, JavaScript and ActiveX must be enabled in your browser's security settings.
- ✦ Adobe Reader
- ✦ MP4 Player

Although not required, the following software is strongly recommended:

- ✦ Microsoft Excel 2000 or later
- ✦ Minitab V13 or higher or JMP V10 or higher

**Program Registration:** To register for any MindPro<sup>®</sup> training program go to [www.sixsigmamindpro.com](http://www.sixsigmamindpro.com). All program registration fees are due at the time of registration. Upon registration, the candidate will be provided with the information and instructions for how to access the MindPro<sup>®</sup> system and programs.

**Refund Policy:** The Six Sigma Management Institute (SSMI) supports and sustains a *Total Customer Satisfaction* policy. This means that SSMI stands behind its training programs (and delivery systems) in terms of product quality, reliability, availability and technical support.

If within 48 hours of system activation, a MindPro<sup>®</sup> customer (i.e., candidate) decides not to pursue the selected program of study, and requests a full refund (for any reason), SSMI will promptly cancel the transaction without discourse, return all monies related to that transaction (to the purchaser) and do so in the most expeditious manner possible. E-mail: [mindpro@ss-mi.com](mailto:mindpro@ss-mi.com).

**License Agreement:** The MindPro<sup>™</sup> delivery system and programming code, as well as the related instructional content, videos, and documents, are the intellectual property of Dr. Mikel J. Harry, Ltd. This property has been

licensed to SSMI under a separate reseller's agreement.

All candidates will be presented a single-user break-seal license agreement during the registration process. When presented the license agreement, the candidate has the ability to accept or reject its terms and conditions. SSMI strongly encourages each candidate to read this agreement prior to acceptance.

Under the terms of this agreement, the candidate must request permission (in writing) to copy or otherwise use any of the material or content contained within the MindPro<sup>™</sup> system. All requests must be directed to Dr. Mikel J. Harry, Ltd. in care of SSMI at [mindpro@ss-mi.com](mailto:mindpro@ss-mi.com).

**Technical Support:** Candidates can receive technical assistance through the following channels:

- ✦ Toll Free: 800 335-6234
- ✦ Direct: 480 515-0890
- ✦ E-mail: [mindpro@ss-mi.com](mailto:mindpro@ss-mi.com)

**Revision Policy:** In the spirit of continuous improvement, SSMI reserves the right to make changes, modifications or updates to any or all of the MindPro<sup>™</sup> delivery system components, at any time it deems necessary. Such changes will be made at the sole discretion of SSMI. Furthermore, SSMI will make every reasonable effort to notify current users of such changes prior to enabling the related functionality.



**Program Testimonials:** It is often the case that previous candidates and respected authorities seek to highlight and share their personal training experiences with others. To this end, the prospective MindPro<sup>®</sup> candidate is encouraged to read what others have had to say about Dr. Harry and the power of Lean Six Sigma.



**Program Citations:** MindPro<sup>®</sup> was made possible through the asserted efforts and kind contributions of many people and organizations. The listing of key contributors credits their guidance, discussions, work, materials, copyrights, publications, presentations,

and ideas. Thanks to such contributors, the benefits of Six Sigma as well as other process improvement initiatives can now be realized by large, medium, and small organizations, as well as individuals seeking professional advancement and recognition through digital learning, coaching and development:



**SSMI Profile:** The Dr. Mikel J.

Harry Six Sigma Management Institute (SSMI) is the world's leading innovator of Six Sigma methodologies, specializing in the research and development of Lean Six Sigma and process improvement training curriculums, delivery systems, supporting tools and resources. By combining Dr. Harry's 20-plus years of experience in the field of Six Sigma along with new technologies, SSMI is able to deliver expert knowledge at a fraction of traditional costs. The SSMI website can be accessed at the following address: [www.ss-mi.com](http://www.ss-mi.com).