

Lean Six Sigma Black Belt Certification

Course Description

The strength of Lean Six Sigma training is that it combines the control of Six Sigma with the speed of Lean Enterprise. Lehigh University's College of Business and Economics Lean Six Sigma Black Belt Certification encompasses an intensive three month period; the objective is to solve a real world problem using the Lean Six Sigma tools. The course includes service (transactional) and manufacturing Lean Six Sigma principles and examples. Successful completion of the certification requirements includes four weeks of classroom training, two on-site support sessions*, demonstrated working knowledge of Lean Six Sigma methodologies, project startup and completion resulting in a Black Belt Certification.

Individuals are required to select a challenging process which impacts customer lead time or service and the quality performance of their organizations. Students who are not affiliated with an organization will choose projects from a variety of organizations who have volunteered to provide applicable course projects.

*Geographical limitations may apply.

Course Schedule

Week 1 Define/Measure: June 1-4, 2004 **Week 2 Analyze:** June 28-July 2, 2004

Week 3 Improve: July 26-30, 2004 **Week 4 Control:** August 23-27, 2004

Fees

- **\$6,500** – includes Minitab software, on-site consulting*, discounts are available for multiple signups/organization (see website for details)
- Signups are limited and will be honored on a first come, first served basis
- Cancellations fees apply for course withdrawals (see website for details)

Features

- Minitab Statistical Software
- Student Notebooks with all Instructors Slides and Support Materials
- CD with Sample Data and Six Sigma Templates for Classroom Exercises
- Project Startup selection support with up to 2 hours of voice mail or e-mail support prior to week 1 training session
- Use of Balanced Scorecard and Strategic Profit Model for Project Selection and Metrics
- Project consulting with course instructors throughout training weeks



Features continued

- Two on-site support sessions (up to 2 hours of support/session- *additional travel and discounted consulting charges apply for organizations farther than 70 miles from Lehigh University Bethlehem PA Campus)
- Logistic Regression Module with emphasis on transactional applications or service applications
- Weekly Project Progress Review via e-mail or fax between classroom training sessions with voice mail and/or e-mail progress feedback from course instructors
- Project Reviews presented by participants at the beginning of training weeks 2, 3 and 4.
- Take home examinations (open book, open notes format) will be provided at the end of each session for participants to complete prior to start of next training session or prior to final certification following the completion of the final week of training.
- Certification review of completed project
- Certification following final project acceptance
- Continental Breakfast, Morning and Afternoon Snacks
- Lunch provided Monday through Thursday, Box Lunch Provided for Friday Travel

Course Topics

Week 1 – Define and Measure (June 1-4, 2004)

This first session is focused on reviewing the overall DMAIC (Define, Measure, Analyze, Improve and Control) and Lean Enterprise processes and how the processes are a natural fit to be combined into an integrated problem solving methodology. Course content, project and other deliverables required for certification will also be reviewed. Project selection and definition, baseline process metrics and scorecards will be examined. Process mapping, introductory statistical topics and failure modes effects will be covered to providing a foundation for process measurements. Introductory Lean topics such as the "5 S" workplace organization, the visual factory and a push versus pull exercise providing the background for the Lean Enterprise training. Process capability will be studied to provide a baseline for process measurements and improvements. Data reliability will be assessed through measurement system analysis. Participants will be required to complete a project plan including deliverables to be completed prior to the second week of training.

- Introduction to Six Sigma and Lean
- How Lean and Six Sigma Complement each Other and Add Value to Organizations
- Project Selection, Definition and Link to Organizational Performance via the Strategic Profit Model, Pick Chart and Balanced Scorecard
- Product and Process Assessment (Rolled Throughput Yield, Defects per Unit, Defects per Million Opportunities)
- Process Mapping and Value Stream Mapping
- XY Matrix, Potential Failure Modes Effect Analysis (PFMEA)



Week 1 Course Topics continued

- 5 S Workplace Organization
- Minitab Basics
- Introduction to Basic Statistics
- Visual Factory or Quality Control by Looking (QBL)
- Push versus Pull Exercise using Total Quality Control
- Capability Analysis
- Measurement Systems Analysis (MSA)
- Project Planning and Deliverables

Week 2 – Analyze (June 28-July 2, 2004)

The second session provides more background on Lean Enterprise by identifying the 7 elements of waste and also defines process design and cycle efficiency which will be used for process analysis. The Six Sigma tools will provide the necessary background for participants to complete the analysis of the processes they are improving as part of their certification project. Major topics include: graphical data analysis, multivariable methods, confidence intervals, hypothesis testing, analysis of variance, correlation and regression. Logistic regression, which is applicable to marketing, customer/supplier and warranty analysis, will be introduced in this session.

- Project Reviews
- Seven Elements of Waste and Categories of Work
- Process Design and Cycle Efficiency
- Analysis of Distributions
- Graphical Data Analysis
- Multivariable Analysis
- Central Limit Theory
- Confidence Intervals
- Hypothesis Testing
- Sample Size Selection
- Analysis of Variance
- Correlation and Regression
- Introduction to Logistic Regression
- Project Planning and Deliverables

Week 3 – Improve (July 26-30, 2004)

The third session continues with the Improve phase of the DMAIC process. Included in this session will be Lean methodologies to improve process standardization, analyze work content and compute Takt time for process cycle time. Statistical topics will include extensions to the basic logistic regression model and design of experiments (DOE) using a catapult model as part of a hands-on application of DOE. The process mapping topic will be expanded by adding value stream mapping. The



Week 3 Course Topics continued

week will be completed by reviewing process time traps, total preventive maintenance and error proofing as part of the Lean Enterprise process analysis and improvement methodologies.

- Project Reviews
- Lean Strategies for Reducing Complexity: Standardization and Optimization
- Designing Work Content and Takt Time
- Logistic Regression
- Introduction to Design of Experiments
- Full and Fractional Factorial Designs
- Catapult Exercise
- Complexity Value Stream Mapping
- Time Trap Analysis
- Total Preventative Maintenance
- Poka-Yoke: Error Proofing
- Project Planning and Deliverables

Week 4 – Control (August 23-27, 2004)

The final week of training will be focused on the Control phase of the DMAIC process. Lean techniques such as production capacity, work place layout and design will be reviewed along with Kanbans and Backflushing techniques for inventory management. The final statistical topics such as the introduction to response surfaces, multiple regression and statistical process control will be completed. The training will be completed using a Lean Six Sigma Simulation where participant teams will analyze, design and implement their own process competing against other teams using throughput time and product quality as measures.

- Project Reviews
- Standardized Production Capacity Sheet
- Work Place Layout and Design
- Introduction to Response Surfaces
- Multiple Regression
- Introduction to Control Methods
- Quality Systems and Statistical Process Control
- Kanbans and Backflushing Techniques
- Continuous Improvement and Kaizen Projects
- Process Control Plans and the Balanced Scorecard
- Final In-Class Lean Six Sigma Simulation
- Project Planning and Deliverables



Instructors

Richard J. Titus, Jr. is the Lead Course Instructor. He is a Master Black Belt who spent nearly 20 years at Ingersoll-Rand in a variety of positions including information systems, materials management, shop operations, manufacturing engineering, design engineering, contract management and quality. Mr. Titus was certified as a Black Belt and Master Black Belt by Six Sigma Qualtec. He completed advanced management skills training with the Mahler Company, Demand Flow® Technology training at the John Costanza Institute of Technology and completed Lean Training with Six Sigma Qualtec and is a certified Interaction Management Facilitator by DDI®. Mr. Titus earned a B.S.I.E. and M.S.M.S.E. from Lehigh University and has been a lecturer with the Lehigh's College of Business and Economics since 2000. He will attend Penn State University beginning in the fall of 2004 to complete his Ph.D. in Engineering.

Michael Bertuch is an expert in turning around and reinventing service and manufacturing companies. As President and CEO of ViaTech Publishing Solutions (<http://www.viatechpub.com/>) he has led a revolution in the way books are produced and distributed in the US. ViaTech has ten US manufacturing facilities that serve 3500 publishers in this country. The firm is also expanding in Latin America and has opened a new facility in Oxford, England. Mike earned a B.S. in Finance and Marketing from Lehigh University and an M.B.A. from Columbia University. He lectures in turnarounds at Columbia University, Cornell University's labor relations program and Lehigh University. Mr. Bertuch continues to consult with organizations on the turnaround process.

ViaTech has been honored several times as one of the "25 fastest growing companies on Long Island" and "50 best private companies on Long Island". Mr. Bertuch was named Ernst & Young's Long Island Entrepreneur of the Year in 1998 and 1999. Long Island Business News also named him to their original list of "40 leaders under 40 years old."

Karen Bushspies is a Master Black Belt with 17 years of experience in the marketing and finance areas. Ms. Bushspies is currently Manager of Parts Pricing and North America Agreements for Flowserve, Inc. Karen was certified as a Black Belt and Master Black Belt by Six Sigma Qualtec. She and her Six Sigma project teams have successfully completed a number of high visibility marketing projects: increasing sales; operating margins; delivery performance and customer satisfaction. In addition to her Six Sigma responsibilities, Karen has implemented a number of new business systems and processes for Flowserve. Ms. Bushspies earned a B.S. in Accounting from Bloomsburg University and M.B.A. from Moravian College.

Peter Cronrath is a Master Black Belt with 15 years of experience in a variety of industries ranging from service to industrial and medical. Mr. Cronrath is currently a Director of Business Performance Excellence for Cordis Corporation, a Johnson & Johnson Company. Mr. Cronrath was certified as a Black Belt and Master Black Belt



Instructors- continued

by Six Sigma Qualtec and Johnson & Johnson. In addition, he is a certified Lean Specialist and has completed Demand Flow[®] Technology and Business Strategy training at the John Costanza Institute of Technology. As a corporate consultant, Mr. Cronrath was part of a Flow Manufacturing Team that implemented some of the first Lean Manufacturing cells at Ingersoll-Rand. Mr. Cronrath earned a B.S.E. from Temple University and an M.S.M.E. from Lehigh University.

Henry Hummell is a Certified Lean Enterprise Specialist with 45 years of industrial experience. Mr. Hummell's career has included a wide variety of positions. He started as a machine operator and went on to become a Numerical Control Machine Programmer, the Supervisor of Methods and Time Study, a Manufacturing, Assembly and Quality Control Supervisor and Manufacturing Process Engineer. Mr. Hummell has taught machining and work measurement at the vocational technical school and college levels. Henry was instrumental in implementing a Safety and Environmental Training Program and was certified as a Lean Enterprise Specialist by Six Sigma Qualtec, contributing to the initial application of Lean Techniques within Ingersoll-Rand. In addition to his interests in Lean Enterprise and manufacturing, he owns and operates a photography business. Mr. Hummell attended Lafayette College.

James Reinbold is a Certified Black Belt with 8 years of industrial experience ranging from steel production to equipment manufacturing and installation. Mr. Reinbold worked as a production supervisor for U.S. Steel and as a Metallurgical Engineer for SMS Demag, where he spent four months commissioning a continuous caster in mainland China. Most recently, he worked as a process and product engineer for Allvac, a supplier of high tech materials, where he was certified as a Black Belt through General Electric's Supplier Black Belt Training program. Jim earned his B.S.Met.E. from Michigan Technological University. Currently he is enrolled as a fulltime student in Lehigh University's MBA and Engineering Master's Degree Program. Jim is a teaching assistant for an operations management course in the College of Business and Economics. He expects to complete his graduate studies in Fall of 2004.



Contact Information

For additional information contact sixsigmatraininginfo@lehigh.edu

or

call Richard Titus at 610-758-5669 or via e-mail at rjt4@lehigh.edu.

Complete course information can be found at www.lehigh.edu/seminars.

Registration Form on next page

Registration forms are also available on the seminar's website at www.lehigh.edu/seminars





Lean Six Sigma Black Belt Certification Course
Registration Form for Summer 2004 Non-Credit Course Offering

Table with 2 columns: Course Topics by Week, Dates/Time. Rows include Week 1- Define and Measure, Week 2- Analyze, Week 3- Improve, Week 4- Control.

Name of Attendee:

Social Security Number:

Company Name:

Mailing Address:

Address Line 1:
Address Line 2:
Address Line 3:

E-mail Address:

Daytime Phone Number:

Course fee: \$ 6,500*

Requirements: Laptop with Microsoft Office 2000 or higher (Minitab Statistical Software will be provided as part of course fee)

- Payment: [] Enclose personal or corporate check payable to Lehigh University, College of Business and Economics
[] Personal or corporate credit card
CREDIT CARD No.
Exp. Date (05-2008)

Register by Mail, Fax (610-758-5283) or E-mail (sixsigmatraininginfo@lehigh.edu):

Mailing Address: Lehigh University
Rauch Business Center – Graduate Programs Office
621 Taylor Street
Bethlehem, PA 18015-3117

For more information please contact Lead Instructor Richard Titus at 610 758 5669 or rjt4@lehigh.edu or visit our Website at www.lehigh.edu/seminars

NON-CREDIT COURSE PARTICIPANTS are not matriculated at Lehigh University, do not receive Lehigh University credits in any form, and do not generate a Lehigh University transcript. Participants who successfully complete course requirements, including completion of certification project, will earn a PROFESSIONAL CERTIFICATION as a LEAN SIX SIGMA BLACK BELT.

Partnering With The Best

