IMPLEMENT THE LEAN PHILOSOPHY IN YOUR ENTERPRISE

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Lean Manufacturing Certificate
Dramatically Reduce Time from Customer Order to Product Delivery

UPCOMING PROGRAM DATES 2013
February 18–22 and March 18–22
April 15–19 and May 13–17
July 22–26 and August 19–23
September 16–20 and October 14–18
November 11–15 and December 9–13
Ann Arbor, Michigan

Graduate degree programs currently offered include:
- Automotive Engineering [online]
- Design Science [online]
- Energy Systems Engineering [online]
- Financial Engineering [online]
- Global Automotive and Manufacturing Engineering [online]
- Manufacturing Engineering [online]
- Pharmaceutical Engineering
- Robotics and Autonomous Vehicles

Indicates programs with an online delivery option.

Graduate Certificates of Advanced Studies in Engineering (CASE) are also available in some of the programs.

Visit isd.engin.umich.edu to learn more about ISD programs.
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About ISD
The mission of Integrative Systems + Design is to study and promote leadership in the design and creation of innovative products and systems. As a unit with a global focus in the College of Engineering, we develop and deliver programs that integrate multiple disciplines and are responsive to the needs of engineers, managers, and other professionals. Our students take courses on the Ann Arbor campus, online, and at off-campus locations around the world.

Professional development short courses and certification programs include:
- Six Sigma Certification
- Transactional Management
- Healthcare Certification
- Design for Six Sigma Certification
- Improvement and Coaching Kata: Building Competitive Advantage with Lean Six Sigma
- Lean Six Sigma Certification
- Lean Product Development Certificate
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The Robby Robot Lego Factory simulation is used to demonstrate hands-on lean concepts. The simulation moves from traditional push manufacturing to pull systems while key concepts such as 5S and one-piece flow are implemented. Additional tools and design challenges are used in the program for in-class, hands-on training.

Real-World Examples
Case studies from real companies are used to demonstrate tools and concepts.

KEY BENEFITS
The program will enable participants to:
- Understand the history, philosophy and core methodologies of lean manufacturing
- Learn to value stream map the current state of a product flow
- Become able to develop a future state map of lean systems
- Learn to create continuous flow through manufacturing cells
- Develop the leadership techniques necessary to actively drive change and lean initiatives

WHO SHOULD ATTEND
This program will benefit any manufacturing, production, purchasing and supply chain professional. Over 9,000 participants have received a Lean Manufacturing Certificate. Program alumni represent a variety of industry sectors:
- Aerospace
- Automotive
- Computer
- Defense
- Furniture
- Glass
- Government
- Logistics
- Plastics
- Semiconductors
- Shipbuilding
- Steel
- Telecom
- Tire
- Tool and Die

CUSTOMIZED PROGRAMS
Our programs can be customized to meet your corporate needs and presented at a location of your choice.
Discuss your requirements with our Corporate Program Specialist at (734) 647-7200 or MEonline@umich.edu.

PROGRAM COMPONENTS
Each two-week program contains core program categories all beginning with a one-day required Overview of Lean Manufacturing session. The remainder of the program is comprised of three core categories: Lean System Design, Supporting Lean Tools and Methods, and Leadership and Team Management Tools and Methods. Each category contains multiple modules. The modules taught vary for each program. Check our website for current program scheduling.

PROGRAM DETAILS
$6,800* COVERS THE ENTIRE PROGRAM
Fee includes tuition, instructional materials, continental breakfast, lunch and breaks each day. Fee is payable in advance. Upon registration, you will receive an email confirmation including directions to the site and recommended lodging.

GROUP DISCOUNT
Register five or more for a group discount of 10% off. Restrictions apply.

HOW TO REGISTER*
Visit our Lean Manufacturing program web page at isd.engin.umich.edu/LeanManufacturing or send an email to MEonline@umich.edu or call (734) 647-7200.

* Program fee at time of brochure printing. Check our current program fee schedule at isd.engin.umich.edu/LeanManufacturing. Fee is subject to change.

PROGRAM INSTRUCTORS

IZAK DUENYAS
John Psarouthakis Research Professor of Manufacturing Management and Professor of Technology and Operations, Stephen M. Ross School of Business; Professor of Industrial and Operations Engineering, College of Engineering.

YAVUZ BOZER
Professor of Industrial Operations Engineering, College of Engineering.

For a full listing of program instructors, please visit our website: isd.engin.umich.edu/LeanManufacturing.
Program alumni represent a variety of industry sectors including Aerospace, Automotive, Computer, Defense, Furniture, Glass, Government, Logistics, Plastics, Semiconductors, Shipbuilding, Steel, Telecom, Tire, Tool and Die.

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ONE-DAY RATE: $835.00

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I. LEAN SYSTEM DESIGN
Overview of Lean Manufacturing
- History
- Philosophy
- Core methodologies

Value Stream Mapping
- Current state mapping
- Future state mapping

Design of Pull
- Mechanics of pull systems
- Kanban quantities
- Container sizes
- Analytical tools to determine inventory

Factory Layout for Lean Manufacturing
- Layout models
- Parts-travel, computer-aided layout

The Physics of Lean
Using Science to Evaluate and Improve Manufacturing Systems (two days)
- Identify leverage points with the greatest impact on the bottom line
- Throughput
- Cycle times
- Customer service
- Quality
- Flexibility

II. SUPPORTING LEAN TOOLS AND METHODS
Cell Analysis and Design
- Creating continuous flow
- Grouping products in cells
- Cell layout
- Allocating work
- Right-sizing equipment for cells

Implementing Kaizen Bursts
- Creating systems around each tool
- Translating value stream maps into action plans
- Building JIT and Built-in-Quality pillar tool systems

Material Handling for Lean
- Parts presentation to operator
- Design/analysis of milk run systems
- Design/analysis of call systems

Designing Standardized Work & Job Instruction Training
- Methodology for developing standardized work
- Tips on how to lead people to follow the standards
- Ensure quick, accurate and complete training of team members
- Break down jobs into elemental components for easy comprehension

Lean Rapid Plant Assessment
- Learn to quickly assess the state of a plant or operation
- Develop realistic improvement plans using the quick assessment
- Determine your operation’s value

III. LEADERSHIP AND TEAM MANAGEMENT TOOLS AND METHODS
Integrating Six Sigma in Lean Systems
- How lean and six sigma work together
- Every employee as a problem-solver
- Review of DMAIC (Define, Measure, Analyze, Improve, Control)

Leading the Change to Lean
- Tools and methods for leading change
- Case studies
- Measuring progress

Accounting & Measurement for Lean Manufacturing
- Using alternative accounting and measurement systems
- Encouraging appropriate behavior in lean systems

Developing & Leading Work Groups
- Fostering team work
- Motivating teams to identify and solve problems
- Developing team structure
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