

SPRING 2012

THE SYSTEMS  
THINKING ISSUE

PROFESSIONAL EDUCATION



## NEWSLETTER

## IN BRIEF

**Advanced Study Program**

On May 17, certificates were presented to 14 ASP Fellows who completed the program. In total, 30 Fellows participated during the Spring semester, including 2 students from newly represented countries: Ireland and Vietnam.

**Career Reengineering Program**

Our 9 CRP fellows have just wrapped up their projects and gave their presentations to their classmates on May 30 and 31. Topics ranged from a history of computing to bacterial biofilms to mergers and acquisitions.

**International Programs**

In the past six months our faculty have been busy travelling internationally to Mexico, Chile, and Italy offering multiple programs in Supply Chain and Lean Enterprise. These programs have attracted a wide range of industries such as banking, services, food & beverage, transportation, energy, mining, manufacturing, and retail while expanding MIT's global footprint.

**Short Programs**

Registration is open and classes will start soon for our on-campus summer short courses. Alongside returning favorites in biopharma, innovation, lean enterprise, manufacturing, and systems engineering will be new offerings on Applied Cyber Security; Decision-Making, Design, and Strategy Under Uncertainty; Build a Laser Radar; and Build a Small Phased Array Radar Sensor.

## DEAR FRIENDS,

In this edition, we highlight our response to the increasing demand from companies around the world for systems and enterprise-oriented learning solutions for their key employees.

Last fall we introduced a three-day course on Lean Enterprise in Chile, which sold out very quickly and generated a considerable waiting list; that strong interest prompted us to offer a second course in the spring. Professor Emeritus Earl Murman, former director of MIT's Lean Advancement Initiative (LAI), led the systems-oriented course that presented lessons from LAI research and devoted more than half the course to hands-on simulations depicting supply chain and manufacturing environments. Earl drew on local faculty from the Catholic University of Chile to provide local context, a critical element in any globally-delivered course.

You will also find an article on the course "Architecting the Future Enterprise," taught by Engineering Systems Professor of Practice Debbie Nightingale and Senior Lecturer Donna Rhodes, which we offered in Milan and Rome. This course, too, emphasized a holistic systems approach to looking at enterprises and charting their future.

In the Faculty Spotlight section, we feature Debbie and Donna, focusing on their backgrounds and emerging projects.

Finally, we profile professor emeritus Jeremy Shapiro, who passed away recently. A long-time contributor to Professional Education, he offered enterprise-oriented courses for us in Cambridge and abroad.

As always, I hope you enjoy reading our stories and would welcome any feedback or comments you may have on the newsletter.

Sincerely,

**Bhaskar Pant, Executive Director**  
MIT Professional Education  
bpant@mit.edu



Bhaskar Pant.  
Photo by Stuart Darsch



## ITALY RESPONDS TO HOLISTIC ENTERPRISE THINKING

**Top Left:** Group photo of Milan students with MIT faculty.

**Top Right:** Milan participants discussing a case study during a class exercise.

### What did MIT Professional Education bring to Italy with the two professional programs in January?

In the two-day programs in Milan and Rome on “Architecting the Future Enterprise,” the MIT faculty leaders delivered new lean tools to understand complex organizations and a framework to envision their futures. The audiences, close to 100 business executives and industry leaders, were delighted to learn concrete ways to lead their organizations in new directions. This offering was unique for Italy.

“In our partnership with MIT Professional Education, we realized that there are two main reasons that make an MIT course a unique experience for Italian managers,” says Danilo Simoni, director of excellence programs for Asset Management, the company that handled course logistics.

“First, there is the mystique that surrounds MIT as the temple of knowledge and the cathedral of innovation. Participating in an MIT event means that you can breathe that mystique and be part of it,” says the Italian event organizer.

“The second reason, which I think is peculiar to southern Europe, is the systematic and pragmatic approach that MIT faculty are able to provide to attendees. Our leaders and managers are incredibly smart and fast thinkers in terms of strategy and understanding, what they probably lack are discipline and execution. The MIT approach provides us a systematic and disciplined approach to executing innovative and creative ideas.”

The program leaders, Deborah Nightingale and Donna Rhodes, delivered key elements of the short program they offer on campus each summer but adapted it for their audience. Industry and organizational leaders in Italy face challenges from a changing regulatory environment and the unsteady euro-zone economy as well as the usual competitive business pressures.

Nightingale and Rhodes helped the participants—chief strategy officers, human resources managers, chief engineers, and sales managers, for example—examine eight elements that must interact smoothly in a high-functioning enterprise: strategy, infrastructure, processes, products, services, knowledge, information, and organization. Through case studies, they helped participants re-imagine their own organizations in a comprehensive way.

“We teach a holistic approach to guide enterprise leaders in understanding their ‘as-is’ enterprise, generating and evaluating alternative concepts, and selecting a ‘to-be’ architecture concept,” they say.

One participant, Ericsson Telecomunicazioni SPA human resources manager Ugo Marrone, appreciated the concrete approach that allowed participants to design a realistic “future proof” model that considered their company’s internal and external elements, social context, and market perspective.

“It’s clear that the methodology proposed is based on the result of a large number of study cases,” says Marrone. “The summing up for managers is an organic and global view of these experiences. It opens your eyes on strategy, positioning, economics, people, communication.”

MIT Professional Education continues to extend MIT’s education resources globally with programs in Mexico and Chile in 2011 and seven international programs in the pipeline for 2012. ▀

# SYSTEMS THINKING: NIGHTINGALE & RHODES

**Two of MIT's leading engineering systems thinkers, Debbie Nightingale and Donna Rhodes, have a terrific partnership as well as distinct careers.** Their work on MIT Professional Education's recent International Program in Italy, "Architecting the Future Enterprise," is just the latest in their collaborations on transforming large-scale organizations using lean principles. Nightingale

and Rhodes began co-teaching a graduate level course in 2004 and they are completing a book for MIT Press about the same subject. Both embrace a holistic approach to this field.

"Taking a holistic approach is the defining difference," Nightingale says of their methodology.

"Most of the time when people look at the architecture of an enterprise, they are taking a single view—looking at the IT or the organization or the process. Our approach is that you have to look at all the parts in parallel."

She uses that philosophy throughout her work, which includes heading the MIT Sociotechnical Systems Research Center (SSRC), a cross-disciplinary center that focuses on high-impact, complex systems, and as co-director of the Lean Advancement Initiative (LAI).

One of Nightingale's newest projects, co-sponsored with LAI and the MIT Collaborative Initiatives, is in healthcare research. She is the project lead on a major new grant from the US Military Health System designed to improve the treatment of military personnel suffering from Post-Traumatic Stress Syndrome and major depression. Her team will review existing services, map enterprise-level decisions and their interactions, and help the Department of Defense create a more efficient and effective operation.

One of the things Rhodes shares with Nightingale is a focus on working with decision makers to forge a new understanding of complex systems, how they interact, and how they can be improved. "We help [decision-makers] create visions for the future," Rhodes says. "We come up with different concepts of what they could do and evaluate those."

In the Systems Engineering Advancement Research Initiative (SEARI), Rhodes is applying systems findings in one industry sector to other enterprises. She is also examining what she calls systems of systems.

"Today is it rare to have one system that is not connected to another system," Rhodes says. "In the defense industry, ground forces are connected to satellites and to ships. You have higher order systems that are comprised of systems in themselves and when you do that, the enterprise itself becomes more challenging than the technology." ▼

## Deborah Nightingale



Professor of the Practice of Aeronautics and Astronautics and Engineering Systems  
Director of MIT Sociotechnical Systems Research Center (SSRC)  
Co-director of the Lean Advancement Initiative (LAI)

### EDUCATION

PhD Industrial and Systems Engineering, Ohio State University  
MS Computer and Information Science, Ohio State University  
BS Computer and Information Science, University of Dayton

### INTERESTS AND INVOLVEMENT

Member, National Academy of Engineering  
Past President and Fellow of the Institute of Industrial Engineers  
Co-author of two books on lean enterprise transformation

### MIT PROFESSIONAL EDUCATION SHORT PROGRAMS

Principles of Enterprise Transformation  
Architecting the Future Enterprise

## Donna Rhodes



Senior Lecturer of Engineering Systems  
Principal Research Scientist, Systems Engineering Advancement Research Initiative (SEARI)  
Principal Research Scientist, Lean Advancement Initiative (LAI)

### EDUCATION

PhD Systems Science, T.J. Watson School of Engineering at SUNY Binghamton  
MS Systems Science, SUNY Binghamton  
BS Anthropology, SUNY Binghamton

### INTERESTS AND INVOLVEMENT

Past President and fellow of INCOSE  
Recipient of the INCOSE Founders Award and several INCOSE Distinguished Service Awards  
Associate Editor, *Systems Engineering* journal

### MIT PROFESSIONAL EDUCATION SHORT PROGRAMS

Architecting the Future Enterprise



## MIT PROFESSIONAL EDUCATION BRINGS LEAN LEARNING TO CHILE

The **Lean Enterprise** short program taught each summer on the MIT campus in Cambridge, MA has historically drawn strong international participation, but when the MIT Professional Education program was offered in Chile in October 2011, interest exploded. The 60 spots were quickly booked and overflow names filled a waiting list.

This LAI Lean Academy program, part of Professional Education's expanding global outreach and its first program in South America, offered Chilean professionals something new—an opportunity to immerse themselves in the lean perspective through MIT's signature hands-on education practices. It was a huge success.

Participants, who included senior managers and engineers from industries as diverse as mining, retail, and health care, uniformly praised the program. One commented, "It provides a good overview and practices of the fundamental concepts. It opened our minds so we can have a philosophy to take our companies to the next level."

The three-day course focused on the anti-waste philosophy of lean manufacturing, articulated in the Toyota Production System and advanced in the 1990s to the enterprise level. The methodology has an ardent following in the auto and aerospace industries and, now, emerging interest from many other sectors. MIT has contributed to this thinking through its Lean Advancement Initiative (LAI) and programs such as the Educational Network (EdNet), an international group of more than 65 universities and colleges developing lean-related curricula.

Earll Murman, an MIT professor emeritus, led the short program along with Engineering Systems Division alumna Alexis Artery SM '01, PhD '06 and California Polytechnic State University Professor José Macedo.

"It's a very robust curriculum with half the time spent on simulations," says Murman, founding director of EdNet and former LAI co-director. "They had never seen anything like it. They were used to business conferences with lectures and case studies. The MIT style of active learning worked well over there."

Professional Education's growing presence in the world—with recent short programs in Japan, India, Singapore, Amsterdam, and Mexico—supports MIT's mission to serve a global community.

"By offering educational programs in other countries, MIT can reach many more people than those who are able to come to Cambridge," says Bhaskar Pant, executive director of MIT Professional Education. "Moreover, faculty are exposed to issues in emerging markets and that knowledge is incorporated into teaching for undergraduate and graduate students here. MIT Professional Education serves as a global portal connecting industry to MIT knowledge and expertise." ▾



### A Message from the Dean

"MIT is able to offer working professionals and companies not only short, intensive courses on campus each summer but increasingly, programs with global relevance at various locations around the world. ... I encourage you to explore all that MIT Professional Education has to offer."

— IAN A. WAITZ, DEAN OF ENGINEERING, MIT

Full text at: <http://web.mit.edu/professional/about/message.html>





# OPERATIONS EXPERT JEREMY SHAPIRO

A CELEBRATION OF HIS LIFE AND WORK



## COMING UP

### Advanced Study Program

Now accepting applications for Fall 2012.

- ▶ On campus Information Sessions: June 20, July 18
- ▶ Details/RSVP at [advancedstudy.mit.edu](http://advancedstudy.mit.edu)

### Short Programs

- ▶ Courses run 2-5 days from June 11–August 10
- ▶ Details at [shortprograms.mit.edu](http://shortprograms.mit.edu)

### International Programs

- ▶ Join us this fall for a first time offering of Lean Enterprise. Please share this news with your international networks.
- Bogota, Colombia: October 31–November 2, 2012
- Sao Paulo, Brazil: November 6-8, 2012
- ▶ To learn more contact [piloto@mit.edu](mailto:piloto@mit.edu)

**Professor emeritus and long-time Professional Education faculty member Jeremy Shapiro passed away on April 14.** Shapiro, who served as co-director of MIT's Operations Research Center for nine years, analyzed real-world decisions in supply chain management, finance, and marketing and was the author of *Modeling the Supply Chain*.

Since 1988, Shapiro taught short programs including Supply Chain Network Design, Demand Driven Supply Chain Management, New Approaches to Optimizing Inventories, and, since 2010, Analytics for S&OP and Network Design. He taught that course globally as well, leading a session in Mexico last September.

"Professor Shapiro was a knowledgeable and enthusiastic teacher," says Anna Mahr, MIT Professional Education associate director. "He was always seeking to understand and deliver what working professionals needed. He will be missed."

He also taught in custom programs. "He had a wealth of knowledge and wanted to share it with students," says Dawna Levenson '83, SM '84, MIT Professional Education associate director. "During his extensive preparation for the custom course for Accenture's Supply Chain practice in Amsterdam, he would constantly seek feedback from his Accenture counterparts to ensure he was delivering a course that would meet their needs."

We will all miss you, Professor Shapiro. ▼

For more information on our programs, visit <http://professionaleducation.mit.edu>

MIT Professional Education  
Massachusetts Institute of Technology  
77 Massachusetts Avenue, 35-433  
Cambridge, MA 02139

