the MIT master’s in engineering and management

educating technical professionals to innovate, collaborate, and lead
the new competitive edge . . .

Now more than ever, companies need leaders who can work effectively across organizational and geographic boundaries in today’s rapidly changing global marketplace.

These leaders must not only understand the technical, managerial, and sociopolitical components of complex business challenges, they need to know how to integrate them successfully as well.

They require an education that goes beyond traditional graduate programs in business or engineering—one that will enable them to use systems thinking to address the multidisciplinary nature of new product development and innovation.

The premier master’s program for companies and the next generation of leaders is System Design and Management (SDM) at the Massachusetts Institute of Technology.
Jointly offered by the No.1-ranked MIT School of Engineering and the top-rated MIT Sloan School of Management, SDM educates mid-career professionals to lead effectively and creatively by using systems thinking to solve large-scale, complex challenges in product development and innovation.

SDM’s master’s program provides:

- a global mindset;
- a systems thinking perspective that integrates management, technology, and social sciences;
- ways to lead across organizational and cultural boundaries to address rapidly accelerating complexity and change in today’s global markets; and
- career-compatible matriculation options—full-time, commuter, and distance.

Graduates earn a master of science degree from MIT in engineering and management.
SDM's curriculum is designed to meet MIT’s high standards and to enable both students and companies to maximize their investment in an SDM education.

All SDM students are required to complete a multi-semester, unified core course focused on methodologies and tools in systems engineering, system architecture, and system and project management. Developed by top MIT faculty from the School of Engineering and the Sloan School of Management, this course closely replicates the concurrent challenges that commonly occur within companies engaged in new product development and innovation.

In addition to the unified core, students take a series of required courses to build their foundation in management and engineering. SDM students may also work with program directors to customize the curriculum to meet their interests and career needs; courses may be taken in the School of Engineering, MIT Sloan, and even at other institutions such as Harvard Business School.

A thesis, generally based on a company’s specific needs, is required of all students.

Details: sdm.mit.edu/education/curriculum.html
At MIT SDM, leadership education is based on the premise that taking a systems approach to innovation is essential to success.

SDM offers a wide range of required and elective courses designed to ground students in theory, concepts, and experiential learning. SDM students discover how to apply systems thinking to:

- be effective team players and strong leaders;
- leverage and maximize each other’s strengths; and
- adapt quickly to ever-changing business environments.

Details: sdm.mit.edu/education/courses.html#leadership

“[SDM] provides foundational thinking on the interaction of business and technology and insight into dealing with large, complex systems—which I would argue are most systems today.”

Bob Smith, Chief Technology Officer and Vice President of Engineering and Technology, Honeywell Aerospace, and SDM ’97

“Defining user needs, allocating functionality, decomposing the system, and defining interfaces were all central lessons I learned at SDM—and these are skills I continually use to make data-driven decisions about our products.”

Lisa Cratty, Director of Device Research and Development, Pre-analytical Systems, BD (Becton, Dickinson and Company), and SDM ’01
SDM graduates provide value at all levels of an organization, throughout the enterprise. Since the program’s inception in 1997, SDM alumni have applied their education across a wide range of industries, among them:

- aerospace
- automotive
- banking/finance
- consumer products
- consulting
- defense
- energy
- healthcare
- information systems/big data
- telecommunications

They have also served in a variety of roles, such as:

- product development
- R&D
- engineering management
- general management
- operations
- project management
- software development
- marketing and sales

Recent SDM graduates have been hired into a range of positions, including product manager, system architect, system engineer, and consultant. Over the course of their careers, SDM alumni have attained senior positions, including CEO and CIO, and taken on VP-level functions.

Moreover, by using systems thinking to drive innovation, many SDM graduates have become successful entrepreneurs within their communities and “intrapreneurs” within their companies.


“The success of systems, however technical or complex, often depends on individual people and personalities in the workplace. [SDM] taught me to think about the human and cultural aspects of system design.”

Malvern Atherton, Chief Design Engineer, Control Systems, Rolls-Royce, and SDM ’04
Intel needed to understand how successful business ecosystems are created and how they affect the design and implementation of an organization’s product strategy. This information would be used to develop future competencies needed by Intel’s product development teams.

Intel selected SDM ’10 student Rutu Manchiganti based on her prior experience as a Motorola software engineer. She conducted a one-year on-site research project in which she interviewed users, marketing professionals, and business managers at top global companies. She then identified disruptive innovation and system dynamics to analyze how successful business ecosystems involving multiple interacting components evolve over time. She also researched the current ecosystem challenges facing Intel and wrote a series of Intel case studies based upon product group experiences.

Intel’s Chris Galuzzo, Manchiganti’s supervisor said, “Rutu’s internship helped us better understand the business ecosystem challenges we face, identify and document internal areas of strength to build upon, and discover new practices to introduce to Intel.”
Vince Mahe, SDM '06, recently oversaw an effort to design the liftgate feature of the new Ford Escape. As lead design engineer, he led a global team that was diverse in thought, expertise, and culture. Together, they designed and developed the Ford liftgate’s groundbreaking, hands-free design in which two sensors and a control module detect the presence of a foot, a shin, and the vehicle’s key, then send a signal to the rear door, which opens automatically.

Mahe applied SDM coursework and methodologies in system architecture, systems engineering, and system design to understand and manage the technical and managerial complexities of requirements analysis, prioritization, design specification, concurrent engineering, testing, safety, and other important elements, as well as to troubleshoot problems.

Thanks in part to the work of Mahe and his team, the Ford Escape was named No. 1 in the affordable compact crossover SUV category. In addition, Mahe starred in several Ford Escape commercials.
Jonathan Skvoretz, senior vice president and change management executive at Bank of America Corporation (BAC) and colleague Doug Hague, SDM '99, senior vice president for analytics, identified a need to measure the company's large-scale change process against industry benchmarks. “BAC had grown through acquisitions, mergers, and integration, however we needed to shift our focus to internal operations, deepening customer relationships, and correcting legacy issues,” Skvoretz explained, adding that BAC executives believed the work would best be done by an outsider who could “give us a fresh perspective.”

BAC funded SDM '10 student Daniel Wallance’s thesis research, which Skvoretz said “provided us with the latest in academic thinking in large-scale change management, with an emphasis on stakeholder engagement methods and tools.” Wallance showed how lean concepts are being applied beyond traditional areas, such as manufacturing, to the finance and services industries. BAC is now using Wallance’s research to document and ultimately enhance change management protocols.

“We’ve found several MIT SDM tools and methodologies that can be used in service-based industries,” said Skvoretz. “BAC can apply these to new frontiers in finance and reap the benefits.”
For information on the MIT SDM master’s program, internships, thesis research, and/or recruitment, contact:

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On the brochure: *Alchemist*, a sculpture by Jaume Plensa, sits across from the main entrance to MIT. (Photo by John Parrillo)