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Professional Course Fuels Creativity of Technology Leaders in India

Teams of senior professionals compete with their hands, glue guns, and basic supplies to build and present a winning product to the class.



On the first day of class in Mumbai, India, technology leaders were immediately forced out of their comfort zone and exposed to the possibility of publicly making mistakes. Accustomed to delegating product development responsibilities to less senior employees, the C-suite leaders were told to go to local coffee shops, hand random customers a coffee cup, and ask about the experience of holding the cup. In addition to gathering feedback on mechanics and usability, the leaders also had to ask customers about their emotional reaction to holding the cup.

Matthew Kressy, Senior Lecturer, Director and Founder at MIT Integrated Design & Management (IDM), and lead instructor for the new MIT Professional Education Professional Certificate

Program course, *Design-Driven Innovation*, explains why: "If you understand those needs and emotions in great detail, solutions come much more easily. Most of the time the problem is that we create solutions to problems that don't accurately reflect the true problem of the stakeholder."

In 2018, the technology industry led the way with the largest percentage of spending dedicated to global research and development at 22.5%, with the healthcare (21.7%) and automotive (16%) industries close behind. With such high spending devoted to development, why do so many companies still struggle to produce great designs?

Kressy stresses how important it is for companies to offer products with emotional value in addition to functional value. Emotional value is multi-faceted, helping drive consumers' purchasing decisions. He believes in interdisciplinary, collaborative, design-driven product development derived from deep user research, creative concept generation, and rapid prototype iteration. He is passionate about the implementation of these elements in the design process. Since 1999, Kressy has co-taught collaborative courses in product design and development at the MIT Sloan School of Management, the Rhode Island School of Design, and Harvard Business School.

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Professional Course Fuels Creativity of Technology Leaders in India

FROM THE EXECUTIVE DIRECTOR



At MIT Professional Education, we take MIT's motto "mens et manus" (mind and hand) seriously in everything we offer globally to our students. We also continually look at what the market expects of us in terms of addressing hot topic areas, and we respond accordingly.

In this year-end spring edition of our newsletter, we lead with a story on how our *Design-Driven Innovation* course, offered in India, made some of the country's technology executives get out of their comfort zone and design product prototypes with glue guns in the classroom. We also feature Ernie Ho from Taiwan, an alumnus of our Advanced Study Program, who got inspired by taking practitioner-oriented graduate courses in AI and robotics at MIT to ultimately found an autonomous vehicles technology company. You will also read about our pioneering effort in introducing Spanish language versions of our blended learning Digital Plus courses to address Spanish language markets in Latin America and Europe, hungry for courses from MIT.

Responding to a wider market demand for certificate programs in concentration areas such as AI/Machine Learning, this summer we are introducing new qualifying courses such as *Applied Blockchain* and new certificate programs in Biotechnology & Life Sciences, and Design & Manufacturing.

In our Faculty Spotlight section, we feature Professor John Williams and Dr. Abel Sanchez who will teach the *Applied Blockchain* course on campus, and a broader blended *Digital Transformation* course online.

Finally, we feature Dr. Jim Bales of MIT's Edgerton Center who has been opening doors to practitioners from around the globe for more than two decades, offering them a chance to gain hands-on experience working with state-of-the-art high-speed imaging equipment.

"Mens et Manus" is alive and well in the service of our clients around the world.

Read on!

Bhaskar Pant
EXECUTIVE DIRECTOR
MIT PROFESSIONAL EDUCATION
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INTERNATIONAL PROGRAMS


(India Story Continued from Cover)

"The importance of *Design-Driven Innovation* is about creating good leaders who are thoughtful in their approach to providing vision, creating strategy, encouraging collaboration, and building vibrant and happy organizations that are excited to tackle very difficult challenges together. We teach a strategy that maximizes the ability to recognize opportunities and potential, while at the same time making sure these strategies are feasible and will generate a positive financial impact for the organization," Kressy said.

Kressy's multidisciplinary approach integrates three keys to product development that help connect with consumers' needs and emotions, and ultimately, their wallets:

- 1. Design** — create products consumers find desirable.
- 2. Engineering** — create products that are feasible, robust, repeatable, and affordable.
- 3. Business** — create products that are viable, and can make a profit.

"*Design-Driven Innovation* incorporates several exercises that help students achieve outcomes they may not have achieved in the past," Kressy said. "One of the very unique aspects of the program is that we force students to be very hands-on in a very diverse set of participants so they get to cross pollinate in the way they think and interact with each other. That relates to MIT's powerful philosophy of Mens et Manus — Mind and Hand. We teach theory and concepts, and then have people practice that with their hands and actually make and create something that demonstrates the power of those concepts."

By leading students through this design-driven and multidisciplinary process, Kressy provides exposure to a powerful organizational framework and toolset that can help leaders consistently create successful solutions. This also helps create a better understanding of how to lead the transition to a design-driven innovative culture within an organization, to create a corporate culture that supports innovation and accepts risk, and to build consensus and provide vision to peers and management. 

FOR MORE INFORMATION ABOUT
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INTERNATIONALPROGRAMS.MIT.EDU

Online Learning Provides Global Access to MIT Knowledge

As part of its commitment to providing global access to MIT knowledge and research, MIT Professional Education recently launched its first online program in Spanish — *Leadership & Innovation* (or *Liderazgo en la Innovación*).

In addition to eliminating a language barrier, this course offers local context for Spanish-speaking technology professionals — thereby promoting regional innovation and personal transformation.

Expanding access to online learning

The program is led by Dr. David Niño, a Senior Lecturer in the Bernard M. Gordon-MIT Engineering Leadership Program. For the first time, he enlisted the teaching assistance of MIT alumnus, Juan Antonio Latasa '91, who led a webinar on entrepreneurship, which complemented Dr. Niño's session on creative thinking. "I was delighted to teach such impressive professionals," Latasa says.

Liderazgo en la Innovación also features an in-person, South American networking event in Lima, Peru. Following the program's conclusion, participants can continue to collaborate on an

exclusive professional, Spanish-speaking alumni LinkedIn Group, and stay connected by reading MIT Professional Education's new Spanish blog. Those who successfully complete the program earn a certificate of completion, delivered for the first time via blockchain.

Electrical engineer Maria del Pilar Rodriguez, originally from Colombia, excelled and was awarded the MIT Professional Education Fire Hydrant Award (FHA). The honor is named for former MIT president Jerome Weisner, who likened an MIT education to drinking from a fire hose. The online program "was very demanding and rigorous," Maria said. "I loved it." She is the first FHA recipient to be invited back as an online learning facilitator for both the English and Spanish languages.

In her role with Booz Allen Hamilton's innovation group, Maria applied the strategies she acquired in *Liderazgo en la Innovación*. She said that the program helped her realize that sometimes "we jump into solutions [too quickly]." Now, she works at NASA HQ and is intentional about helping her



DIGITAL PLUS PROGRAMS

team fully understand the problem at hand before working on solutions.

Building on a strong start

Spurred by *Liderazgo en la Innovación*'s success, MIT Professional Education has introduced two additional blended programs — *Machine Learning: from Data to Decisions* and *Digital Transformation: From AI and IoT to Cloud, Blockchain, and Cybersecurity*.

Launching in summer 2019, three new two-day, blended workshops for *Liderazgo en la Innovación* online will be launched in Madrid, Lima and Gyaquil utilizing top FHA recipients and MIT Professional Education Alumni as facilitators.

Bhaskar Pant, Executive Director of MIT Professional Education, is proud of the progress made in these global programs. "Big questions face industry today," Pant says. "We will continue to help professionals around the world overcome those challenges through innovative programming, and thereby transform society for the better." →

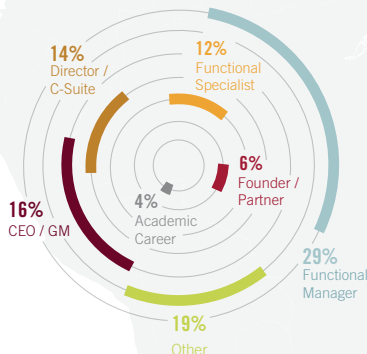
PARTICIPANT DEMOGRAPHICS FOR *LIDERAZGO EN LA INNOVACIÓN*

500+ PARTICIPANTS

COUNTRIES

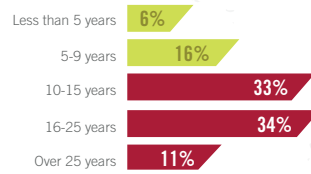


PROFESSIONAL PROFILE



WORK EXPERIENCE

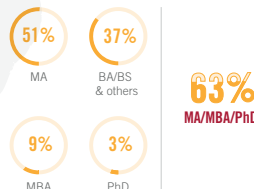
78% 10+ YEARS OF EXPERIENCE



WOMEN



EDUCATION LEVEL



BLENDED & COLLABORATIVE LEARNING

- In-person networking event in Latin America
- Online & blended programs in Spanish
- Master Class via webinar by MIT alumnus
- Spanish LinkedIn Group
- Certificates issued via blockchain
- Spanish blog
- MIT Professional Education Alumnus as learning facilitator

FOR MORE INFORMATION ABOUT DIGITAL PLUS PROGRAMS, VISIT DIGITALPLUS.MIT.EDU



Student Profile:

Ernie Ho



By taking part in MIT Professional Education's Advanced Study Program, Ernie Ho found the tools — and the community — he needed to realize his vision and launch his career in robotics.

How does a student at a top business school in Taiwan acquire the machine learning skills required to launch multiple tech startups? For Chien-Chih “Ernie” Ho, it was by accessing the latest research and strategies — and a powerful network of mentors and colleagues — in MIT Professional Education’s Advanced Study Program (ASP).

Diving into robotics at MIT

After being involved in two serious car accidents, Ernie dedicated himself to an important goal: to develop self-driving car technology that could save millions of lives by preventing similar collisions. However, as a student at National Chengchi University, an institute recognized for its business program, he had limited access to resources in technology education. Though he taught himself to program — winning several international software competitions in the process — it was difficult to find opportunities in the self-driving car industries.

“In Taiwan, few people and schools are involved in the autonomous vehicle industry. I knew I needed an environment where I could learn advanced technologies.” Ernie said. “My mentor told me that if I wanted to study disruptive technology, I needed to go to MIT.”

To gain the tools and knowledge he needed to pursue his passion, Ernie applied and

was accepted to ASP through the School of Engineering, and became a full-time student in the Electrical Engineering and Computer Science Department in 2015.

Utilizing ASP’s flexible course selection and comprehensive support services, he was able to personalize the program to suit his unique career goals, enrolling in courses like *Artificial Intelligence* (6.034) and *Robotics: Science and Systems* (6.141).

“The ASP staff is really dedicated to helping students achieve their goals. Their advice and support was invaluable,” Ernie said. “It was the first time that I felt like my dream was finally starting to take off.”

Developing as an innovator and entrepreneur

While enrolled in the Artificial Intelligence course, Ernie connected with his instructor, Patrick Winston, the Ford Professor of Artificial Intelligence and Computer Science. As a principal investigator at the MIT Computer Science and Artificial Intelligence Laboratory (CSAIL), Professor Winston studies how vision, language, and motor faculties account for intelligence, and explores applications of AI.

“I was a little intimidated by Professor Winston at first — he’s so smart and respected,” Ernie said. “But he’s genuinely committed to helping his students. After I took his course, he became my research advisor, and played a critical role in many areas of my life. Even now, I still come back to his office and get his advice whenever I need to make a big decision.”

In addition to taking courses, Ernie gained hands-on experience building autonomous vehicles by participating in research with CSAIL and the MIT Media Lab. After completing his year of study in ASP, he stayed at MIT for an additional six months as a visiting researcher in the MIT Media Lab. This experience not only helped him continue developing his AI and machine learning

skills; it left him with a motto that has shaped his career: deploy or die.

“At the Media Lab, I was exposed to so many ideas from diverse fields — psychology, architecture, computer science, and more,” Ernie said. “But I was continually reminded that innovation alone isn’t enough. If you’re not developing something that will make an impact on the world, what’s the point?”


Under the guidance of Professor Winston and Dr. Kai-Fu Lee, Ernie decided to put his new mindset into practice at Carnegie Mellon University Robotics Institute — the birthplace of the autonomous vehicle — where he built on his ASP experience by earning a Master’s degree in Robotic System Development and working on a self-driving car perception system at Uber Advanced Technologies Group.

Connecting to the MIT community

For Ernie, the ASP experience not only provided a strong foundation in robotics — it helped him to build a network of colleagues who have helped shape his career path. Shortly after completing ASP, Ernie joined colleagues from MIT and Carnegie Mellon to compete in the Longhush Hackathon in Tokyo. The team took second place with an AI algorithm designed to identify suspicious blockchain transactions. The idea eventually became Ernie’s first business venture — the anti-money laundering platform, UnBlock Analysis. His strategy partner, former Wells Fargo Senior Vice President Hwa Ping Chang, was also an MIT connection. The two connected through an online MIT networking group.

In addition to his work with UnBlock Analysis, Ernie continues to develop technology related to autonomous vehicles through his startup Beyond Sight, Inc. The company, which resulted from a business deal with a global manufacturing company, seeks to address critical issues for autonomous vehicles, including sensor occlusion, pedestrian unpredictability, and labor-intensive data labeling.

As he builds his companies, Ernie remains grateful for his time at MIT — and the many ways that ASP prepared him for his current career.

“If I hadn’t participated in ASP, I wouldn’t have the skillset to build autonomous vehicles, or the entrepreneurship skills to start a high-risk business,” Ernie said. “More important, I wouldn’t have met the talented people that have helped to build UnBlock Analysis and Beyond Sight — ventures that I hope will make the world a safer and better place.” 

FOR MORE INFORMATION ABOUT THE ADVANCED STUDY PROGRAM, VISIT ADVANCEDSTUDY.MIT.EDU

Applied Blockchain Course Grabbing Attention of Global Technology Leaders



FACULTY SPOTLIGHT

John R. Williams



Blockchain remains a massive trend that is as promising and potentially disruptive as ever. The distributed ledger technology is being piloted in a number of industries, making it a highly sought-after job skill.

To meet the global industry demand for talent, MIT Professional Education launched a new summer course, *Applied Blockchain*. The class is taught by Dr. Abel Sanchez and John Williams, MIT faculty members with a long history of working with MIT Professional Education.

The duo also collaborated to develop professional-level courses on cybersecurity, IoT, AI and DevOps.

“We meet with a lot of companies around the world through our work with MIT Professional Education, and find there is a lot of interest in these cutting-edge topics, but I’ve been blown away by the reaction I get when I mention the new blockchain course. Blockchain is like a magic word, and I think that speaks to the potential this emerging technology has to become deeply entrenched in the enterprise,” said Sanchez.

Sanchez and Williams also recently launched a Digital Plus Programs course, *Digital Transformation: From AI and IoT to Cloud, Blockchain, and Cybersecurity*, which is now being offered in English and Spanish — further expanding MIT Professional Education’s global outreach. Professor Williams added, “Our goal is to provide professionals with the critical knowledge they need to be successful and unleash the full potential of technical advancements. The more people we reach, the more we inspire creativity and nurture innovation. Perhaps, with luck, our work will help solve some of the world’s greatest challenges.”

Dr. Sanchez holds a Ph.D. from MIT and is the Executive Director of MIT’s Geospatial Data Center (GDC). His areas of specialty include the Internet of Things (IoT), Big Data, Cybersecurity, and Digital Innovation.

John R. Williams, Professor of Information Engineering, Civil and Environmental Engineering, and Engineering Systems Director at MIT, is internationally recognized in the field of computational algorithms for large-scale particle simulators and has authored two books and over 100 publications.

Abel Sanchez



Access to High-Speed Imaging Systems Helps Industry Solve Problems



Associate Director Jim Bales, who earned his Ph.D. in Physics from MIT, has been with the Edgerton Center since 1998. In the early 2000s, he launched a MIT Professional Education Short Programs course, *High-Speed Imaging for Motion Analysis: Systems and Techniques*. Each summer, Dr. Bales opens the doors to MIT’s Edgerton Center to practitioners from around the globe, offering them a chance to gain hands-on experience working with state-of-the-art high-speed imaging equipment.

The Edgerton Center is the lab of the late Harold “Doc” Edgerton — an MIT professor of electrical engineering who was renowned for his work in high-speed imaging and strobe lights, and whose iconic photographs show a bullet going through an apple or the splash created from a drop of milk.

After Edgerton passed away, his lab was designated a “teaching museum” that has since grown into a hands-on learning resource for people of all ages who want to explore new ideas and fast-moving objects.

“Some of the cameras in the lab cost \$100,000 or more, so it’s unique for people in industry to have the opportunity to come in and experience these systems first-hand. Manufacturers also come to demo, and deliver training. In addition, we cover lenses and lighting techniques. It really is a unique program,” said Dr. Bales.

Despite a nearly two-decade-long run, the summer course continues to fill up year after year.

How does the course stay in the spotlight? In part because of the boost from media coverage. In the past year alone, Dr. Bales has been interviewed by reporters at WCVB Ch. 5, Boston’s ABC affiliate station, as well as several industry trade publications, including *All About Circuits*, *Vision Systems Design* and *Photonics Magazine*.

“I meet researchers from all fields, each with unique high-speed imaging needs. It’s gratifying to share these new ideas and applications to help people in industry who are trying to solve real-world problems,” said Dr. Bales. “And the media is always eager to hear about cutting-edge applications, such as how high-speed imaging is being used for military, manufacturing, automotive and even life sciences.”

Given all the press, soon Dr. Bales may feel just as comfortable in front of the camera as he is behind it.

New Programs Launching to Meet Market Demand

MIT Professional Education Adds Short Courses and Professional Certificate Programs

MIT Professional Education is a global learning destination for science, engineering, and technology professionals. Its portfolio of innovative courses is a critical component of the Institute's mission to provide a gateway to MIT research for practitioners around the world.

Keeping pace with industry evolution

MIT Professional Education's programs are designed to provide crucial knowledge in specialized areas. "We examine research being done at the Institute and determine how it can be tailored to help practitioners and organizations meet current market demands," said Bhaskar Pant, Executive Director of MIT Professional Education. "The latest research, knowledge, and expertise are at the core of everything we do."

Courses cover an array of in-demand topics, and are delivered in two primary formats: as short, intensive on-campus courses, or Professional Certificate Programs, which allow for in-depth exploration of focused topic areas.

Short Programs: Bridging knowledge and skill gaps

To keep pace with recent advances in technology, science, and engineering, MIT Professional Education introduced six new Short Programs courses.

In *Deep Learning for AI and Computer Vision* and *Applied Blockchain*, professionals learn to utilize the latest digital strategies to drive innovation and create competitive advantage. Those who want to rethink their organization's design process and improve decision-making can gain the insights they need in four other new courses: *Design-Driven Innovation*, *Advanced Business Resiliency*, *Inclusive Innovation: Designing for a Better World*, and *Designing Tomorrow's Cities*.

Certificate Programs: Transforming careers, organizations, and industries

The highly sought-after Professional Certificate Programs provide participants with access to cutting-edge research, industry best practices, and breakthrough insights. Alongside accomplished peers from around the world,




SHORT PROGRAMS

participants explore the strategies shaping their markets and industries, and engage with faculty who are recognized experts in their field.

To meet growing demand for flexible, multidisciplinary education, two new professional certificates have been added: *Biotechnology & Life Sciences* and *Design & Manufacturing*.

The *Professional Certificate Program in Biotechnology & Life Sciences* includes courses on biotherapeutics, downstream processing, fermentation technology, communication, and leadership. The *Professional Certificate Program in Design & Manufacturing* addresses the next generation of manufacturing — additive manufacturing, 3D printing, robotics, advanced materials, computational intelligence, and more.

Pant notes, "MIT Professional Education continuously evolves. Our in-demand Short Programs courses and Professional Certificate Programs help professionals and organizations around the world grow their capabilities, launch new ventures, and drive meaningful change." 

FOR MORE INFORMATION ABOUT SHORT PROGRAMS, VISIT [SHORTPROGRAMS.MIT.EDU](https://shortprograms.mit.edu)



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