PROFESSIONAL EDUCATION

# DIGITAL TRANSFORMATION:

## FROM AI AND IOT TO CLOUD, BLOCKCHAIN, AND CYBERSECURITY

The digital frontier is vast. Learning the practical applications for your business is the key to success.

Delivered in collaboration with EMERITUS

# OVERVIEW

A digital revolution is currently underway. Technology permeates every aspect of our society: communication, education, medicine, transportation, farming, and manufacturing. Cryptocurrencies are disrupting banking systems. Hyperconnectivity—through communication systems, sensors, wearables, and smart devices—has blurred the boundary between the physical and digital worlds.

Professionals who understand the implications of big data, and more importantly how to leverage it, can help their companies connect to customers and stakeholders with efficiency and precision, creating new opportunities and staying ahead of competition. Digital platforms offer fundamental improvements to traditional business models, can transform entire industries, and are key drivers of growth. Web-based enterprises that leverage digital infrastructure can enter markets quickly and move with agility in the new digital economy.

In a rapidly expanding digital marketplace, legacy companies without a clear digital transformation strategy are being left behind. How can we stay on top of such rapid—and sometimes radical—change? How can we position our organizations to take advantage of these new technologies? How can we track and combat the security threats facing all of us as we are swept forward into the future?

This online program will cut through the jargon, the misinformation, and the hype to expose the reality of digital transformation and its implications for our changing economic landscape.

International Data Corporation (IDC) predicts global spending on technologies and services enabling digital transformation will reach $1.3 trillion in 2018

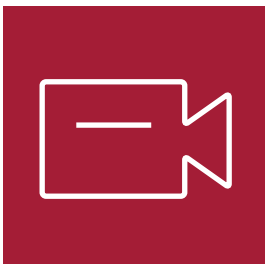
# WHO IS THIS PROGRAM FOR?

This online program provides a guided tour of the key technologies transforming industry and commerce. Professionals in traditional companies poised to implement strategic change, as well as entrepreneurs seeking to harness the opportunities afforded by new technologies, will learn the fundamentals of digital transformation and secure the necessary tools to navigate the digital frontier with confidence. Participants come from a wide range of industries and include C-suite executives, business consultants, corporate attorneys, risk officers, marketing, R&D, and innovation enablers.

Although some assignments include hands-on exercises and web-based demonstrations, no previous programming or software development experience is necessary to benefit from this online program.

# YOUR LEARNING JOURNEY

This online program takes you through the fundamentals of digital technologies that are transforming our world today. Led by MIT faculty at the forefront of data science, participants will learn the history and application of transformative technologies such as blockchain, artificial intelligence, cloud computing, IoT, and cybersecurity as well as the implications of employing—or ignoring—digitalization.



### Video lectures and discussions

Each module includes a series of video lectures by MIT faculty, accompanied by more informal discussions on select topics.

### Demonstrations and interactive assignments

Demonstrations and online exercises accompany each module. These serve to illustrate key concepts, such as blockchain creation, password fallibility, understanding algorithms, and cloud infrastructure.

### Peer discussion groups

Discussion boards are an integral part of each module and provide a forum where participants can interact, share ideas, and ask questions.

### Live Q&A sessions

Live webinars with MIT faculty provide opportunity for additional instruction as well as Q&A sessions for the group.

*Note: MIT Professional Education reserves the right to change the curriculum and delivery of the program to improve the participant experience.*

# INDUSTRY EXAMPLES

Digital transformation has touched nearly every corner of modern life. Industries used to illustrate concepts in this online program include:

## BANKING

Will cryptocurrencies and blockchain technology help prevent bank crises and defaults?

## MEDICAL

Explore how the Internet of Things can control global supply chains and detect counterfeit drugs.

## ENTREPRENEURIAL VENTURES

How has Everything as a Service (EaaS) revolutionized the startup and how can traditional enterprises compete?

## MANUFACTURING

How will machine learning and blockchain technology influence supply chain management?

## EDUCATION

Will machine learning and AI change the way we learn and teach language?

## CYBERSECURITY

Watch a demonstration on how cybercriminals crack passwords and learn how you can protect yourself.

# PROGRAM MODULES

**Module 1:**

## Blockchain Foundations

**Explore the history and evolution of blockchain, as well as the fundamentals of its structure.**

- Distributed ledgers, public keys, and hash functions
- Synchronous vs. asynchronous computing
- Mining and consensus
- Transactions vs. contracts
- Industry influence of Bitcoin and Ethereum

**Module 2:**

## Blockchain Applications

**Explore the applications of blockchain beyond cryptocurrency and how the evolution of smart contracts expanded its possibilities to include any industry or business function.**

- Legal contracts
- Financial inclusion
- Identity ownership and control
- Initial coin offerings
- Decentralized autonomous organizations
- Autonomous cities



**Module 3:**

## Artificial Intelligence and the Future of Work

**Learn the impact of AI implementation on multiple industries and focus on how AI impacts labor and the working economy.**

- Changing labor force
- Language translation
- Evolution of learning
- Human augmentation
- Defense and cybersecurity
- Data science teams

**Module 4:**

## Cloud

**Learn about the inoperability issues that paved the way for cloud solutions, cloud computing structure, and implementation.**

- Basics of the Cloud mode
- Services and shared resources
- Containers and virtual machines
- Mobility and scalability
- Microservices
- Serverless functions
- Everything as a Service (EaaS)

**Module 5:**

## The Internet of Things

**Explore how the unprecedented expansion of IoT devices enable innovation in areas such as business, manufacturing, and health care.**

- Connections and interoperability
- Data collection and management
- Process manufacturing
- Privacy and security concerns

**Module 6:**

## Cybersecurity

**Explore how industries struggle to keep pace with the rapidly changing landscape of cyber-attack methods as well as how to develop impervious security strategies.**

- Password hacking
- Browser privacy
- VPNs
- IoT security risks
- Cyber-attack patterns
- Finding talent

# PROGRAM FACULTY

DR. JOHN R. WILLIAMS

Professor of Information Engineering and Director of MIT's Geospatial Data Center

Dr. John Williams holds a BA in Physics from Oxford University, an MS in Physics from UCLA, and a Ph.D. in Numerical Methods from University of Wales, Swansea. His research focuses on the application of large-scale computation to problems in cyber-physical security and energy studies. He is director of MIT's Geospatial Data Center and from 2006-2012, he was Director of the MIT Auto-ID Laboratory, which invented the Internet of Things.

He is author or co-author of over 200 journal and conference papers, as well as the book, RFID Technology and Applications. Alongside Bill Gates and Larry Ellison, he was named as one of the 50 most powerful people in Computer Networks.

He consults to companies including Accenture, Schlumberger, SAP Research, Microsoft Research, Digital Steam Inc., Kajima Corp., Rockwell Hanford, Sandia National Laboratories, Dept. Homeland Security National Infrastructure Simulation and Analysis Center, US Bureau of Mines, Motorola, Phillip-Morris Inc., Ford Motor Company, Exxon Production Research, Mobil, Shell, Gulf Canada, and ARAMCO.

His international collaborations include Hong Kong University of Science and Technology and PolyU Hong Kong, Imperial College of Science and Technology-UK, Malaysia University of Science and Technology (MUST) and Masdar Institute of Science and Technology (Abu Dhabi.) He organized the first Cyber-Physical Security Conference in 2011 in the UK and along with Dr. Sanchez, he runs the MIT Applied Cyber Security Professional Education summer course.

# PROGRAM FACULTY

DR. ABEL SANCHEZ

Research Scientist and Executive Director of MIT's Geospatial Data Center

Dr. Abel Sanchez holds a Ph.D. from the Massachusetts Institute of Technology (MIT). He is the Executive Director of MIT's Geospatial Data Center, architect of "The Internet of Things" global network, and architect of data analytics platforms for SAP, Ford, Johnson & Johnson, Accenture, Shell, Exxon Mobil, and Altria. In cyber security, Dr. Sanchez architected impact analysis of large-scale cyber-attacks designing Cyber Ranges for the Department of Defense (DOD).

In password security, Dr. Sanchez led the design of a password firewall (negative authentication) for the Intelligence Advanced Research Projects Activity (IARPA) agency. In machine learning, addressing fraud detection, Dr. Sanchez designed a situational awareness framework that exploits different perspectives of the same data and assigns risk scores to entities for Accenture.

He led the design of a global data infrastructure simulator, modeling follow-the-sun engineering, to evaluate the impact of competing architectures on the performance, availability, and reliability of the system for Ford Motor Company. He has been involved in developing e-learning software for Microsoft via their I-Campus Program and with establishing the Accenture Technology Academy, an online resource for over 200,000 employees. He has 10 years of experience with learning management systems and has made deployments in America, Asia, and Europe. He teaches MIT courses on cybersecurity, engineering computation, and data science and has produced over 150 educational videos.

# CERTIFICATE

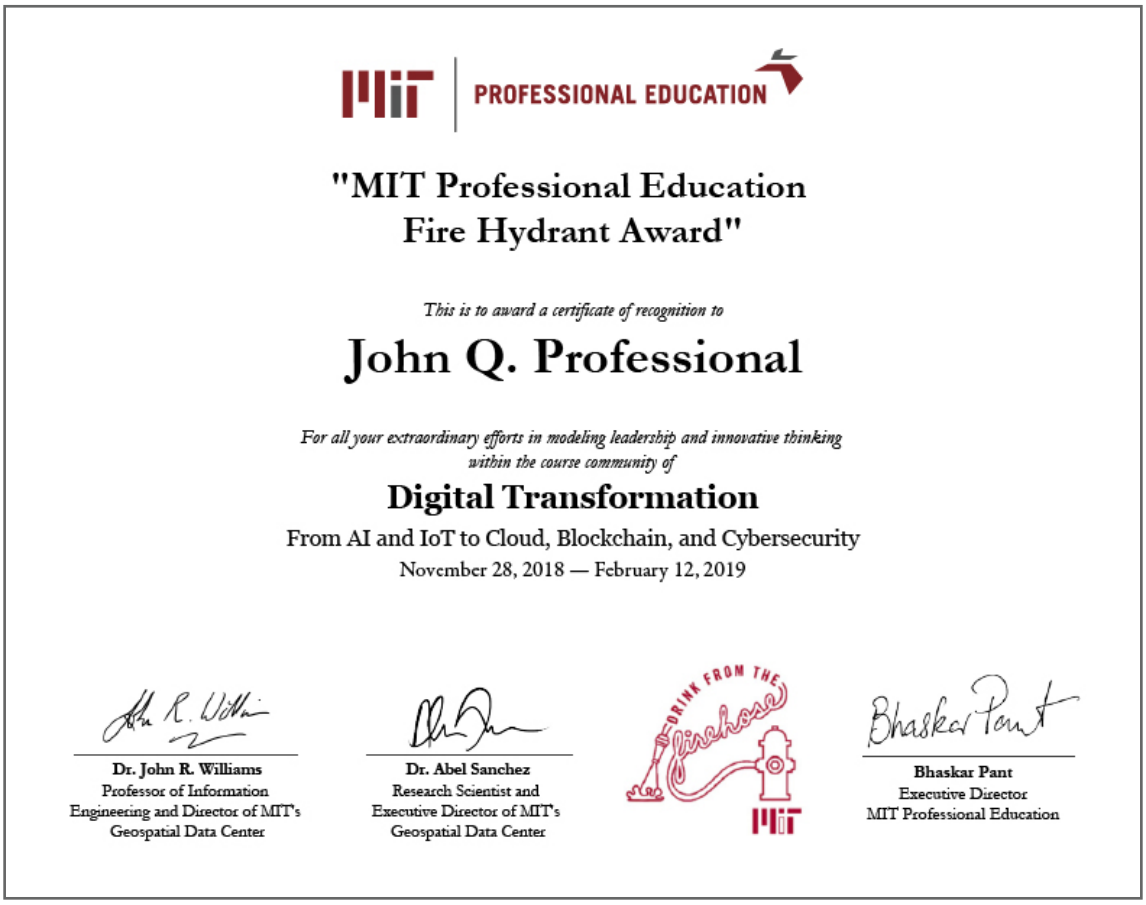
Get recognized! Upon successful completion of the program, MIT Professional Education grants a certificate of completion to participants. This program is graded as a pass or fail; participants must receive 80% to pass and obtain the certificate of completion.

**3.5 Continuing Education Units Awarded**

# SPECIAL ACHIEVEMENT AWARD

## MIT Professional Education Fire Hydrant Award

It's said that studying with MIT is like drinking from a fire hose—intense, immensely satisfying. For those participants who demonstrate leadership by going above and beyond in the program, they'll receive the coveted Fire Hydrant Award. This award can be displayed in professional bios, such as on LinkedIn. Decisions are made by MIT program faculty and facilitators based on participation and behaviors that exemplify exceptional leadership and contribution to the overall program experience for the cohort.



## DURATION

2 months, online

6-8 hours/week

## PROGRAM FEES

$2,300

## ABOUT EMERITUS

MIT Professional Education is collaborating with online education provider EMERITUS Institute of Management to offer a portfolio of high-impact online programs. By working with EMERITUS, we are able to broaden access beyond our on-campus offerings in a collaborative and engaging format that stays true to the quality of Massachusetts Institute of Technology. EMERITUS's approach to learning is based on a cohort-based design to maximize peer-to-peer sharing and includes live teaching with world-class faculty and hands-on project-based learning. In the last one year, more than 13,000 students from over 120 countries have benefitted professionally from EMERITUS's courses.

EMERITUS

## CONNECT WITH A PROGRAM ADVISOR

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