PROFESSIONAL EDUCATION

APPLIED DATA SCIENCE PROGRAM: LEVERAGING AI FOR EFFECTIVE DECISION-MAKING

LEARN HOW TO BECOME A DATA-DRIVEN DECISION MAKER WITH THE 12-WEEK LIVE VIRTUAL PROGRAM DELIVERED BY MIT FACULTY

Now Featuring ChatGPT and Generative AI Modules

USING A "LOW CODE" APPROACH

ABOUT MIT PROFESSIONAL EDUCATION

A leader in engineering and technology education for 70 years, MIT Professional Education provides world-class learning opportunities for professionals who are looking to advance their careers, creatively address complex problems, and build a better future.

Our blend of traditional classroom instruction with leading online technology enables better learning outcomes, while promoting engagement and collaboration.

MISSION

MIT Professional Education provides a gateway to renowned MIT research, knowledge and expertise for working professionals engaged in science and technology worldwide, through advanced education programs designed for them.

Central to MIT's vision, MIT Professional Education fulfills the mandate to connect practitioner-oriented education with industry, and to incorporate industry feedback and knowledge into MIT education and research.

ABOUT THE PROGRAM

Data is getting created at a rapid pace. It is estimated that more than 2 quintillion bytes of data have been created each day in the last two years. As organizations experience an overflow of data, they are sparing no effort to extract meaningful insights to make smarter business decisions. In order to help you unravel the true worth of data, MIT Professional Education offers Applied Data Science Program: Leveraging AI for Effective Decision-Making.

In this program that lasts for 12 weeks, you will be able to upgrade your data analytics skills by learning the theory and practical application of supervised and unsupervised learning, time-series analysis, neural networks, recommendation engines, regression, and computer vision, to name a few. Moreover, the program offers a focus on AI and ML-based projects and case studies, providing you with real-world applications and experiences in utilizing AI for data-driven decision-making.

Upon successful fulfillment of requirements, you will receive a Certificate of Completionfrom MIT Professional Education at the end of the program.

PROGRAM BENEFITS

- Learn from award-winning MIT faculty via live virtual sessions from the convenience of your home.
- Fuel your career transition with 1-on-1 career sessions, resume and LinkedIn review, and an e-portfolio with multiple hands-on projects and a 3-week capstone project.
- Receive a Certificate of Completion from MIT Professional Education.
- Benefit from live mentorship from industry experts on the applications of concepts taught by faculty.
- Earn 16.0 Continuing Education Units (CEUs) on successful completion of the program.

PROGRAM STRUCTURE

This is a 12-week program

2 weeks	Foundational courses on Python and Statistical Science.
6 weeks	Core curriculum including practical applications. Involves 58 hours of live virtual sessions by MIT faculty and industry experts, with hands-on practical applications and problem solving.
1 week	Project submissions.
3 weeks	Final, integrative capstone project.
Self-Paced	2 modules on ChatGPT and Generative AI.

Please note: The live virtual sessions with MIT faculty will be held on Mondays, Wednesdays, and Fridays at 9:30 AM EST. Recordings of the live virtual sessions will be available, allowing you to review the sessions at your own convenience.

WHO IS THIS PROGRAM FOR?

- Professionals who are interested in a career in Data Science and Machine Learning.
- Professionals interested in leading Data Science and Machine Learning initiatives at their companies.
- Entrepreneurs interested in innovation using Data Science and Machine Learning.

AFTER THIS COURSE YOU WILL BE ABLE TO

- Understand the intricacies of Data Science techniques and their applications to real-world problems.
- Learn how various Machine Learning techniques can be used to solve complex problems and make data-driven business decisions.
- Develop a strong understanding of how Python is used to apply Data Science.
- Understand the theory behind recommendation systems and explore their applications to multiple industries and business contexts.
- Explore the realms of Machine Learning, Deep Learning, and Neural Networks, and how they can be applied to areas like Computer Vision.
- Build an industry-ready portfolio of projects to demonstrate your ability to extract business insights from data.

PROGRAM CURRICULUM

The program is 12 weeks long:

2 weeks for foundations
6 weeks of core curriculum, including practical applications
1 week for project submissions
3 weeks for a final, integrative capstone project
2 self-paced modules on ChatGPT and Generative AI

Module 1 — Week 1 & 2

Foundations - Python and Statistics

- Python Foundations - Libraries: Pandas, NumPy, Arrays and Matrix handling, Visualization, Exploratory Data Analysis (EDA)
- Statistics Foundations: Basic/Descriptive Statistics, Distributions (Binomial, Poisson, etc.), Bayes, Inferential Statistics

Module 2 — Week 3

Data Analysis & Visualization

- Exploratory Data Analysis, Visualization (PCA and t-SNE) for visualization and batch correction
- Introduction to Unsupervised Learning: Clustering includes - Hierarchical, K-Means, DBSCAN, Gaussian Mixture
- Networks: Examples (data as network versus network to represent dependence among variables), determine important nodes and edges in a network, clustering in a network

Module 3 — Week 4

Machine Learning

- Introduction to Supervised Learning -Regression
- Model Evaluation- Cross Validation and Bootstrapping
- Introduction to Supervised Learning- Classification

Learning Break — Week 5

Module 4 — Week 6

Practical Data Science

- Decision Trees
- Random Forest
- Time Series (Introduction)

Module 5 — Week 7

Deep Learning

- Intro to Neural Networks
- Convolutional Neural Networks
- Transformers

Module 6 — Week 8

Recommendation Systems

- Intro to Recommendation Systems
- Matrix
- Tensor, NN for Recommendation Systems

Learning Break — Week 9

- Time for participants to finish and submit their projects

Module 7 — Week 10-12

Capstone Project

- Week 10: Milestone Submission
- Week 11: Final Submission
- Week 12: Synthesis + Presentation

Self-Paced Modules with an Optional Masterclass

Introduction to Generative AI

- Overview of ChatGPT and OpenAI
- Implications for Work, Business and Education
- Prompt Engineering for Fine-Tuning Outputs

ChatGPT: The Development Stack

- Mathematical Fundamentals for Generative AI
- Transformer Models: Generative AI for Natural Language
- Hands-On ChatGPT Prototype Creation

Great Learning Hackathon (Optional) Week 13-14

Hackathons allow you to collaborate with a variety of working professionals and learn from each other's achievements and failures. During the 3-day hackathon, you will be working as a team to code a data science-backed solution to a problem statement with an aim to maximize its on a certain evaluation metric

Benefits:

- Get the chance to work as a part of a team
- Gain access to a live leaderboard to view your ranking
- Display your problem-solving capabilities
- Earn a certificate of achievement from Great Learning

Sample Hands-on Projects

Healthcare

Malaria Detection

Detect whether Red Blood Cells (RBCs) are infected with malaria using Image Classification Techniques

Concepts Used:

Image Classification, Convolutional Neural Networks

Real Estate

AI-Powered Boston House Price Prediction

Predicting house prices in the Boston metropolitan area based on features of the property and its locality using Regression techniques

Concepts Used:

Linear Regression, Logistic Regression, and K-Nearest Neighbors

Marketing

Predicting Potential Customers

Identifying leads who are more likely to convert to paid customers based on their attributes and interaction details

Concepts Used:

Decision Trees and Random Forests

Retail

Amazon AI Product Recommendation System

Recommending the best Amazon products available to users based on past rating data using AI-driven recommendation techniques

Concepts Used:

Rank-Based, Similarity-Based, Matrix Factorization-Based, and Content-Based Recommendation Systems

Examples of Capstone Projects

BFSI

Loan Default Prediction

Build a classification model to predict clients who are likely to default on their loans. Give recommendations to the bank on important features to consider while approving a loan.

Concepts Used:

Logistic Regression, Decision Trees, Random Forests, and Ensemble Methods

Research

Facial Emotion Detection

Use Deep Learning and AI techniques to create a Computer Vision model that can accurately detect facial emotions. The model should be able to perform multi-class classification on images of facial expressions and categorize them according to the associated emotion.

Concepts Used:

Artificial Neural Networks, Convolution Neural Networks, Computer Vision, Transfer Learning, and CNN Regularization

PROGRAM FACULTY

Devavrat Shah

Director, Statistics and Data Science Center (SDSC) at MIT
Professor, Electrical Engineering & Computer Science (EECS) at MIT, PhD (Stanford University)

Munther Dahleh

Director, MIT Institute for Data, Systems and Society (IDSS)
William A. Coolidge Professor, Electrical Engineering & Computer Science (EECS) at MIT, PhD (Rice University)

Caroline Uhler

Henry L. & Grace Doherty Associate Professor, Institute for Data, Systems and Society (IDSS) and Dept. of Electrical Engineering & Computer Science (EECS) at MIT, PhD (UC Berkeley)

John N. Tsitsiklis

Clarence J Lebel Professor, Dept. of Electrical Engineering & Computer Science (EECS) at MIT, Professor, Laboratory for Information and Decision Systems (LIDS) at MIT, PhD (MIT)

Stefanie Jegelka

X-Consortium Career Development Associate Professor, Electrical Engineering & Computer Science (EFCS) at MIT, Member, Computer Science & Artificial Intelligence Labo

Program faculty are subject to change.

PROGRAM MENTORS

The program coaches you to work on hands-on industry relevant projects by Data Science and Machine Learning experts via live and personalized mentored learning sessions to give you a practical understanding of core concepts.

Bradford Tuckfield
Founder and Data Science Consultant, Kmbara

Selcuk Baran
Research Science Manager, Amazon Web Services

Matt Nickens
Manager, Partnership Science, Meta

Udit Mehrotra
Senior Data Scientist, Dell Technologies

Tara Ann Thomas
Senior Analyst Data Scientist, Johnson & Johnson Vision

Kalle Bylin
Data Engineer - Business Planning, IKEA

Mustafa Shaikh
Senior Data Scientist, Walmart Canada

Marco De Virgilis
Senior Actuarial Data Scientist, Allstate

Rohit Dixit
Senior Data Scientist, Siemens Healthineers

Animesh Gupta
Data Scientist, WestJet

Omar Attia
Senior Machine Learning Engineer, Apple

Fahad Akbar
Co-Founder & Core Contributor, PyCaret

Shannon Schlueter
Co-Founder, CTO and Data Scientist, Calido

Lee Tanenbaum
Global Director of Data Science and Analytics, Anheuser-Busch InBev

Vaibhav Verdhan
Analytics Leader, Global Advanced Analytics, AstraZeneca

Andrew Marlatt
Data Scientist - Revenue Expansion, Shopify

Nikhar Shah
Senior Data Scientist, Nestlé

Nitin Ranjan Sharma
Data Scientist, Novartis

PROGRAM MANAGER YOUR PERSONAL GUIDE

Your Program Manager will assist you through the journey to ensure you achieve your learning objectives. They will act as your sole point of contact during the program, supporting you and ensuring that you receive appropriate and timely assistance from the ecosystem. Along with monitoring your progress, they will be there to give you the necessary encouragement to ensure your success.

LEARNER TESTIMONIALS

Here's what some of our learners have to say about their program experience:

"The platform used to deliver the program was highly organized. World-class professors taught the program and the mentors' level of engagement was astonishing. I have never had the same experience with other platforms. Thank you for your hard work and great support!"

KHASHAYAR EBRAHIMI, Ph.D
Senior Engineer, Solver and Developer
Gamma Technologies, LLC (US)

"As a busy professional, I am incredibly thankful for the flexibility this program offered without diminishing the experience of hands-on learning. My program manager was incredibly responsive, empathetic and professional. I enjoyed this program very much and would recommend it to anyone interested in learning these skills."

TANYA JOHNSON
Customer Engineering Manager
Google (US)

"The program was a wonderful hands-on learning experience. The lecturers and mentors are top-notch, and the pace was intense but very engaging! The learning format and applications of concepts allow you to apply them across case studies and projects. The program support team was extremely helpful and requests were resolved quickly".

BASIL BALUTA
CEO and CTO
Plexina Inc. (Canada)

LEARNER TESTIMONIALS

Here's what some of our learners have to say about their program experience:

"The content and delivery by MIT professors was consistently high-quality and engaging. The program faculty and mentors were knowledgeable and the staff was collaborative, helpful, and enthusiastic throughout the journey. Thank you so much for this whole experience!"

SABINA SUJECKA
AI Interaction and Product Designer
Orange Labs R&D (USA)

"I want to thank the mentors, MIT professors, teaching assistants, and everyone who made the Applied Data Science Program run smoothly. I really learned a lot from the program and I feel much more confident in exploring data and machine learning. The mentors did an excellent job providing context for topics and going through examples."

MATTHEW WOLF
Former Postdoctoral Fellow
University of Guelph (Canada)

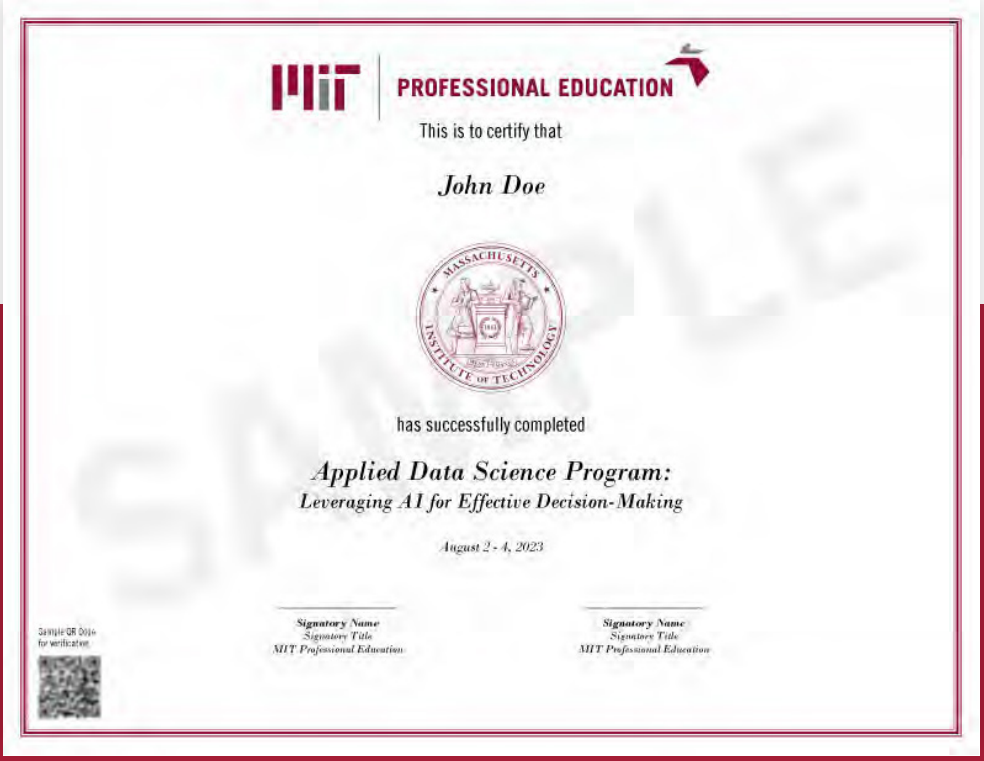
"I believe this program is one of the best Data Science programs out there. It is aptly designed in terms of duration as well as materiàl and depth covered. It offers a great opportunity to attend live lectures and learn from some of the best faculty members in the world."

ABHISHEK M.
Principal Data Scientist
Nielsen (US)

"The program structure is laid out perfectly with working professionals in mind. The delivery mechanism is tuned to 21st century education. MIT professors provide great context and breadth about the topics covered. The weekend sessions with Great Learning mentors provide real, applicable industry skills that are directly translatable to the workforce."

ARMAN SEUYLEMEZIAN
Research Scientist
Jet Propulsion Laboratory (USA)

CERTIFICATE OF COMPLETION



The image is for illustrative purposes only. The actual certificate may be subject to change at the discretion of MIT Professional Education.

APPLICATION PROCESS

STEP-1

Application Form
Register by completing the online application form.

STEP-2

Application Screening
Your application will be reviewed to determine if it is a fit with the program.

STEP-3

Join the Program
If selected, you will receive an offer for the upcoming cohort. Secure your seat by paying the fee.

APPLICATION & FEE DETAILS

Program Duration:
12 weeks

Prerequisites:
Exposure to Computer Programming and a High School-Level Knowledge of Statistics and Mathematics

Fees:
USD 3900

Program Completion Criteria:
Learners should score at least 60% in each course, including the Elective and Capstone Project.

MIT Professional Education's Applied Data Science Program: Leveraging AI for Effective Decision-Making, with curriculum developed and taught by MIT faculty, is delivered in collaboration with Great Learning.

Great Learning

POWER AHEAD

Great Learning is a leading global ed-tech company for professional and higher education. It offers comprehensive, industry-relevant programs across various cutting-edge Technology, Data, and Business domains. These programs are developed in collaboration with the world's foremost academic institutions such as MIT Professional Education, Wharton Online, The University of Texas at Austin, Northwestern School of Professional Studies, Deakin University, Great Lakes Institute of Management, and more. They are constantly reimagined and revamped to address the dynamic needs of the industry. Offered in blended, classroom and purely online modes, these programs are delivered with the help of expert mentors and highly qualified faculty. Great Learning is on a mission to enable transformative learning and career success in the digital economy and has impacted 11 million+ learners from over 170 countries.

READY TO BECOME A DATA-DRIVEN DECISION MAKER?

APPLY NOW

Contact Great Learning for more information about MIT Professional Education's Applied Data Science Program: Leveraging AI for Effective Decision-Making

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https://professional-education-gl.mit.edu/mit-data-science-program