DATA SCIENCE  
DATA TO INSIGHTS

COURSE NAME: Data Science: Data to Insights
COURSE STARTS: MAY 30, 2017  
DURATION: 6 WEEKS

COURSE INFORMATION ONLINE: digitalprograms.mit.edu/ds
LOCATION: Online  |  CEUs: 1.3  |  COST: $625  |  CONTACT: mitprofessionalx@mit.edu

COURSE DESCRIPTION
The ability to quickly analyze and act on data has increasingly become an organizational imperative. To help you extract critical insights from large volumes of data, MIT Professional Education has partnered with the MIT Institute for Data, Systems, and Society (IDSS) to offer Data Science: Data to Insights, a new, six-week online course. By gaining a greater understanding of data science fundamentals, you’ll be well prepared to address your company’s most complicated data analytics challenges.

KEY BENEFITS
Turn Knowledge into Action:
During this in-depth, online course, you will:
• Learn how to apply data science techniques to effectively address your organization’s challenges.
• Uncover common pitfalls in big data analytics and strategies for avoiding them.
• Deepen your understanding of machine learning and how it works in practice.
• Interpret models and learn the right questions to ask to make better business decisions.

In addition to learning from MIT’s leading data science experts, you’ll delve into case studies and put your knowledge into action by:
• Tracking the 2D and 3D position of objects with a Kalman filter
• Building your own movie, music, and product recommendation systems
• Automatically clustering news stories with a spectral technique algorithm
• Predicting wages with a linear regression model
• Exploring one or two layer perceptrons to assess their decision boundaries
• Using network-theoretic ideas to identify new candidate genes that might cause autism

WHO SHOULD ATTEND
Data Science is well suited for data scientists, business analysts, engineers, technical managers, and other professionals who wish to transform large volumes of data into actionable insights. Designed to serve as an introduction to data science analytics, this course is appropriate for both early career professionals and senior managers.

COURSE FORMAT
MIT Professional Education Digital Programs are designed to fit the schedules of busy professionals. That’s why each course is delivered via the edx online learning platform and available online 24 hours a day, 7 days a week.

Program Highlights
• Video tutorials, case studies, and research-based content from distinguished MIT professors
• Complete course transcript
• Robust collaborative environment that fosters networking

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COURSE OUTLINE

Data Science features five key modules:

Module 1: Making Sense of Unstructured Data
Learn how to sift through vast quantities of data to discover patterns or latent structure. In this module, you’ll review modern analytic tools including clustering, dimensionality reduction, and spectral techniques.

Module 2: Regression and Prediction
Gain a solid foundation in classical linear and nonlinear regression as well as modern regression with high-dimensional data. In addition, you’ll explore how to solve prediction problems by leveraging regression trees, boosted trees, and random forests.

Module 3: Classification, Hypothesis Testing and Anomaly Detection
Review statistical methods of classification, testing hypothesis and its applications, including detection of statistical anomalies, detection of frauds, spams, and other malicious behaviors. By exploring several examples, you’ll gain a deeper understanding of the applications, limitations, and usage of these methods.

Module 4: Recommendation Systems
Discover why recommendation systems have become the primary way to uncover relevant information from vast amounts of data. From Netflix and YouTube to Spotify and Amazon, learn how top organizations are using algorithms to design and develop these powerful systems.

Module 5: Networks and Graphical Models
Explore top methods for using data to analyze large networks, determine their behavior or functionality, and infer missing data. In this module, you’ll also focus on how graphical models can help you model network processes and facilitate efficient statistical computation.

In each module, faculty will demonstrate the usefulness of methods used through real world case studies.

INSTRUCTORS

Professor Devavrat Shah, Co-Director
Professor, Laboratory for Information and Decision Systems (LIDS), Computer Science and Artificial Intelligence Laboratory (CSAIL) and Operations Research Center (ORC)

Professor Guy Bresler
Assistant Professor, Electrical Engineering and Computer Science, LIDS and IDSS

Professor Victor Chernozhukov
Professor, Department of Economics; Center for Statistics

Professor Stefanie Jegelka
Assistant Professor, Institute for Data, Systems, and Society (IDSS), Electrical Engineering and Computer Science (EECS) Department

Professor Ankur Moitra
Assistant Professor, Department of Mathematics and member of the Computer Science and Artificial Intelligence Lab (CSAIL)

Professor Philippe Rigollet, Co-Director
Assistant Professor, Mathematics department and Center for Statistics

Professor Tamara Broderick
Assistant Professor, Institute for Data, Systems, and Society (IDSS), Electrical Engineering and Computer Science (EECS) Department

Professor David Gamarnik
Professor, Sloan School of Management

Professor Jonathan Kelner
Associate Professor, Department of Mathematics and a member of the MIT Computer Science and Artificial Intelligence Laboratory (CSAIL)

Professor Caroline Uhler
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