



# 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](https://digitalprograms.mit.edu/ds)

**LOCATION:** Online | **CEUs:** 1.3 | **COST:** \$625 | **CONTACT:** [mitprofessionalx@mit.edu](mailto: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

### 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.

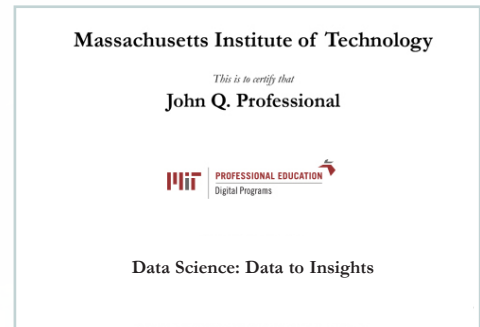
#### Program Highlights

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

**LEARN MORE AND REGISTER AT > [digitalprograms.mit.edu/ds](https://digitalprograms.mit.edu/ds)**

### EARN A CERTIFICATE AND CEUS

Participants who successfully complete all program requirements are eligible to receive a Certificate of Completion, 1.3 CEUs and an invitation to join MIT Professional Education alumni's LinkedIn group and additional benefits.



### 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.

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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

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