

Course Schedule

WEEK & MODULE	CONTENT AND DEADLINES
<p>WEEK 1 Module 1: Making Sense of Unstructured Data</p> <p>Faculty Leads Stefanie Jegelka & Tamara Broderick</p>	<p>Compulsory non-graded Entrance Survey (complete this survey in order to view the course content).</p> <p>Introduction Clustering (Tamara Broderick)</p> <p>Case Studies: Case Study 1: Genetic Codes Case Study 2: Finding themes in Project Description</p> <p>Graded Activities ★ Complete Module 1.1 graded activity assessment (<i>DUE At end of course</i>)</p> <p>Spectral Clustering, Components, and Embeddings (Stefanie Jegelka) Case Studies: Case Study 3: PCA: Identifying Faces Case Study 4: Spectral Clustering: Grouping News Stories</p> <p>Graded Activities ★ Complete Module 1.2 graded activity assessment (<i>DUE At end of course</i>)</p>
<p>WEEK 2 Module 2: Regression and Prediction</p> <p>Faculty Leads Victor Chernuzkov</p>	<p>Classical Linear and Nonlinear Regression and Extensions Case Studies: Case Study 1: Predicting Wages 1 Case Study 2: Gender Wage Gap</p> <p>Modern Regression with High-Dimensional Data Case Study Case Study 3: Do poor countries grow faster than rich countries?</p>

The Use of Modern Regression for Causal Inference

Randomized Control Trials

Observational Studies with Confounding

Case Studies

Case Study 4: Predicting Wages 2

Case Study 5: The Effect of Gun Ownership on Homicide Rates

Graded Activities★ Complete Module 2 graded activity assessment (*DUE At end of course*)**WEEK 3****Module 3.1****Classification and Hypothesis Testing****Faculty Leads**David Gamarnik &
Johnathan Kelner**Hypothesis Testing and Classification****Case Study**

Case-study 1: Logistic Regression: The Challenger Disaster

Graded Activities★ Complete Module 3.1 graded activity assessment (*DUE At end of course*)**WEEK 4****Module 3.2 Deep Learning****Faculty Leads**

Ankur Moitra

Deep Learning**Case Study**

Case Study 2: Decision boundary of a deep neural network

Graded Activities★ Complete Module 3.2 graded activity assessment (*DUE At end of course*)**WEEK 5****Module 4****Recommendation Systems****Faculty Lead**Devavrat Shah &
Phillipe Rigollet**Recommendations and Ranking****Collaborative Filtering****Case Studies**Case Study 1: Recommending Movies ★**Graded**

Case Study 2: Recommend New Songs to the Users based on their listening habits.

Case Study 3: Make New Product Recommendations

Wrap-up

Guidelines on building system
Parting remarks and challenges

Graded Activities

★ Complete Module 4 graded activity assessment (*DUE At end of course*)

Recommended Weekly Activities

★ Graded Case Study

Solve and Submit your Case Study (*DUE Sunday night at end of week*)

Review and submit the work of your peer (*DUE the next night*)

WEEK 6 Module 5: Networking and Graphical Models

Faculty Lead

Caroline Uhler &
Guy Bresler

Introduction Networks Graphical models

Case Studies

Case study 1: Navigation / GPS

- 1.1: Kalman Filtering: Tracking the 2D Position of an Object when moving with Constant Velocity
- 1.2: Kalman Filtering: Tracking the 3D Position of an Object falling due to gravity.

Case study 2: Identifying New Genes that cause Autism

Graded Activities

★ Complete Module 5 graded activity assessment (*DUE At end of course*)

WEEK 7 MODULE 6: Predictive Analytics

Faculty Lead

Kalyan
Veeramachaneni

Predictive Modeling for Temporal Data Feature Engineering

Case Studies

Case Study 1: NYC Taxi ★**Graded**

Case Study 2: UK Retail Dataset

Graded Activities

★ **Complete ALL graded activities assessments** (*DUE At end of course*)

★**Graded Case Study**

Solve and Submit your Case Study *(DUE Sunday night at end of week)*

Review and submit the work of your peer *(DUE The next night)*

Required Activities

Complete Exit Survey *(DUE Last day of course)*

Course Certificate

Retrieve your MIT Course Certificate and 1.8 CEUs *(Download it from your Dashboard – released day after course ends)*

Course Access

+6 months after course ends

After this date, the course closes and content is archived (no longer access to the course)
