

# Course Syllabus

## Data Science Immersive: Summer 2016

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### PART 1: TOOLS AND THEORY FOUNDATION

Week 1. Python for Data Science: The Basic Tools of a Data Scientist

- June 13: Python Essentials
- June 14: Python Essentials
- June 15: NumPy Essentials and Matplotlib
- June 16: SciPy, Pandas and Seaborn
- June 17: SQL and SQLAlchemy

Week 2. Statistics and Mathematics Review: Making the Right Choices

- June 20: Probability
- June 21: Statistics Foundations
- June 22: Statistics Continued
- June 23: Linear Algebra
- June 24: Review

### PART 2: SUPERVISED LEARNING

Week 3. Regression, Regularization, Resampling: Working with Continuous Data

**Guest Lecturer: IBM**

**Photographer On Site**

- June 27: Simple Linear Regression
- June 28: Multiple Linear Regression
- June 29: Regularized Regression and Model Selection
- June 30: Resampling Methods

**Hollywood Data Science Meetup**

- July 01: Review

#### Week 4. Classification: Working with Categorical Data

- July 4: HOLIDAY
- July 5: Logistic Regression
- July 6: Naive Bayes and k-Nearest Neighbors
- July 7: Tree-Based Methods
- July 8: Support Vector Machines (SVM) and Linear Discriminant Analysis (LDA)
- **July 9: Group Outing**

## PART 3: UNSUPERVISED LEARNING

#### Week 5. Dimensionality Reduction and Clustering: You Don't Know What You Don't Know

##### Guest Lecturer

- July 11: Review of Week 4
- July 12: Principal Component Analysis (PCA)
- July 13: Clustering Methods
- July 14: Nonnegative Matrix Factorization (NMF)
- July 15: Review

## PART 4: ADVANCED TOPICS

#### Week 6. Time Series: Looking at Data Through Time (Mike)

##### Guest Lecturer

- July 18: Time Series Analysis Fundamentals
- July 19: Machine Learning for Time Series Analysis
- July 20: Signal Processing Fundamentals
- July 21: Machine Learning for Signal Processing
- July 22: Review
- **July 24: Group Outing**

#### Week 7. Artificial Neural Networks: Biologically Inspired Computing

- July 25: Theory of Neural Networks: Borrowing from a Biological Model
- July 26: Basic Neural Nets: RBFs and KSOs
- July 27: Recurrent Neural Networks
- July 28: Deep Learning
- July 29: Review

Week 8. NLP, Web Scraping, and Topic Modeling: Giving Meaning to Text (Mike)

**Guest Lecturer**

- August 1: Foundations of NLP
- August 2: Topic Modeling
- August 3: Sentiment Analysis
- August 4: Web Scraping
- August 5: Review
- **August 7: Group Outing**

Week 9. Big Data: Scaling Up (Mike)

- August 8: Hadoop and MapReduce
- August 9: Hive & Pig
- August 10: Spark 1
- August 11: Spark 2
- August 12: Review
- **August 14: Group Outing**

## **PART 5: PUTTING IT ALL TOGETHER**

Week 10. Capstone and Interview Preparation (August 15 - 19)

**Guest Lecturer**

**Preparing Your Data Science Resume Lecture**

**Resume Building 1-on-1 Sessions**

**August 21: Group Outing**

Week 11. Capstone and Interview Preparation (August 22 – 26)

**Interviewing Dos & Don'ts Lecture**

**Recruiter 1-on-1 Sessions**

Weeks 12.: Capstone and Interview Preparation (August 29 – September 2)

**Mock Interview Sessions**

**Capstone Presentations**