

# IDC: Interdisciplinary Computing Courses

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## Courses

### **IDC 6145 Big Data Analytics for Data Science**

College of Sci and Engineering, Department of Mathematics & Statistics

3 sh (may not be repeated for credit)

A new approach to effectively analyzing, understanding, learning, and managing data is necessary for the data that originates from instruments, sensors, Internet transactions, emails, click streams, and/or all other digital sources. Analytics has drawn more attention and has emerged as some of the most important, cutting-edge fields in a variety of fields, from corporate intelligence to scientific research. This course will examine essential big data technologies, trends, infrastructure, and management challenges, enabling students to make prudent decisions when confronted with them. with extensive data sets In addition, students will gain practical experience developing for popular big data platforms using Python, Java, or Scala.

### **IDC 6146 Deep Learning for Data Science**

College of Sci and Engineering, Department of Mathematics & Statistics

3 sh (may not be repeated for credit)

This course is an introduction to deep learning, a branch of machine learning focusing on the development and application of neural networks. Applications of deep learning play a significant role in recent advances in technology, such as automated hearing and speech translation, automated driving, fraud detection, and various aspects of healthcare. This course covers a range of topics in deep learning, including biophysical background, mathematical preparation, basic neural networks, convolutional and recurrent network models, optimization methods, and applications to real-life problems. Through hands-on projects, students will learn how to implement deep learning algorithms and formulate their analysis into a report. In the final project, students will apply the techniques they learn in the course to real-world scenarios with a problem of their choice.

### **IDC 6210 Machine Learning for Data Science**

College of Sci and Engineering, Department of Mathematics & Statistics

3 sh (may not be repeated for credit)

This course provides a broad introduction to modern machine learning, including supervised learning (multiple linear regression, logistic regression, and decision trees), unsupervised learning (clustering, dimensionality reduction, and anomaly detection), model evaluation (k-fold cross validation & performance evaluation metrics) and hyperparameter tuning. The goal of course is for the students to master the key theoretical concepts and gain the practical know-how to quickly and powerfully apply machine learning to challenging real-world problems via hands-on projects.

### **IDC 6940 Capstone Projects in Data Science**

College of Sci and Engineering, Department of Mathematics & Statistics

3 sh (may not be repeated for credit)

The Data Science Capstone course is designed for students to use the knowledge and skills that they have gained in the program to solve real-world data-driven problems. This final project will allow students to gain experience in data wrangling, data visualization, statistical modeling and prediction, machine learning applications, reporting, and presenting the results. Upon completing this course, students will have a data product (paper and slides) to show to potential hiring managers.