Minor in Data Analytics NEW

The best thing about being a statistician is that you get to play in everyone's backyard. *John Tukey*

Overview

Data analytics is an interdisciplinary area of study drawing on mathematics and statistics, computer science, and a field of application (e.g. business, biology, chemistry, political science, psychology, ...). The minor in data analytics is an excellent supplement for any major program, and since many of the courses are only two credits or count towards the Core, it is relatively easy to fit into almost any 4-year major program. Students will learn to manage data, program a computer in different languages, and apply statistical, data mining, and machine learning techniques to solve real-world problems. A capstone project requires students to address a data analytic problem from problem statement and formulation to completion by reporting results to an appropriate professional audience.

Required Courses

- **DAT 200 Data Analytics I** (2 credits) An introduction to databases and SQL queries. Topics include how to create, read, and use Structured Query Language (SQL), design, population, query, and use of databases.
- **CS 113 The Power and Beauty of Computing** (4 credits, NPS Core) or **CS 121 Computer Science I** (4 credits)
  - CS 113 - An introduction to programming in Python with an emphasis on creativity, abstraction, data, algorithms, programming, the Internet, and impact.
  - CS 121 - An introduction to programming in Java with an emphasis on the fundamental concepts of computer organization, machine-level representation of data, algorithmic development, and structured programming.
- **MA 251 Probability and Statistics** (4 credits, MA CORE) An introduction to the basic principles of descriptive statistics, experimental design, and statistical inference.
- **MA 252 Statistical Methods in Research** (4 credits) A second course in statistics introducing students to traditional statistical methods for research using regression, ANOVA, time series, and nonparametric methods. Students complete projects in the base SAS® software.
- **DAT 300 Data Analytics II** (2 credits) An introduction to the fundamentals of data preparation and management, data mining, and forecasting using the SAS® Enterprise Miner. Prerequisite: MA 252.
- **DAT 315 Machine Learning in R** (2 credits) An overview of machine learning techniques using R. Topics include an introduction to programming in R, the use of nearest neighbor and naive Bayes algorithms, support vector machines, hidden Markov models, and market basket analysis as well as model evaluation and improvement. Prerequisites: CS 113 or CS 121, DAT 300.
- **MOOC** Completion of one Massive Open Online Course (MOOC). Choose an *approved* MOOC on a topic of your choice from any reputable source like Coursera, EdX, or Udacity, which offer a wide variety of appropriate courses either for free or for a very low price. Sample topics include genomics, business intelligence and visualization with Tableau, sabermetrics (baseball), Hadoop and MapReduce, etc...
- **DAT 400 Data Analytics Capstone** (SLE, 4 credits) Under the supervision of a faculty mentor, students use their knowledge of data analytics to complete a project contributing to research in an academic area or to solve a problem for a local business. Projects will involve data collection, data cleaning, data analysis, and reporting results both orally and in writing to a domain expert or a business leader. Prerequisite: Completion of 14 credits in the minor.