M.S. in Data Science (30 credits)
Training Data Scientists

In today's AI-driven economy, there is a strong demand for **data scientists** equipped with computational skills to develop, design and apply models and tools for data-driven decision making. Companies use data science and AI for marketing decisions, targeted customer recommendations, determination of profitable insurance coverage as well as for providing personalized financial advice.

The M.S. in Data Science covers basic and advanced methods in statistical inference, machine learning, data visualization, data mining, and big data, all of which are essential skills for a high-performing data scientist. To be admitted to the program, we require a basic background in Mathematics (calculus, linear algebra), Statistics (probability and basic stats) and Software Development (programming, data structures and algorithms). A GRE score is not required. This part-time degree program involves 10 courses of 3 credits each, taught over 5 semesters of 15 weeks each (including summer). Courses consist of formal lectures as well as hands-on programming projects.

The program curriculum uses the Python programming language with its data science libraries and features tools like R for statistical analysis and Tableau for data visualization. Students work on homework assignments and projects covering both theory and applications on real data with guidance from the professor and teaching assistants.

Recommended part-time credit schedule: Two courses (6 credits) per semester over five consecutive semesters, including Summer. Start is possible in Fall, Spring or Summer semesters.

Core (required) courses:

Math 661	Applied Statistics
CS 675	Machine Learning
CS 644	Big Data
CS 636	Data Analytics with R Programming
CS 677	Deep Learning

Sample electives:

Math 630	Linear Algebra and Applications
CS 602	Java Programming
CS 610	Data Structures and Algorithms
CS 631	Data Management System Design
CS 632	Advanced Database System Design
CS 634	Data Mining
CS 670	Artificial Intelligence
CS 732	Advanced Machine Learning
CS 735	High Performance Analytics for Data Science
IS 601	Web Systems Development
IS 631	Enterprise Database Management
IS 634	Information Retrieval
IS 665	Data Analytics for Information Systems
IS 687	Transaction Mining and Fraud Detection
IS 688	Web Mining

Prerequisites and Admissions:
To be eligible for admission, a student must have a B.S. degree with a minimum GPA of 2.8 on a 4.0 scale and have the following background (typically obtained through a BS in a STEM field):

- Calculus: Derivatives, integrals, applications
- Linear Algebra: Vector spaces, dot products, Euclidean norm, matrices
- Probability and Statistics: Random variables, probability distributions, basic statistics
- Programming: Basic programming constructs, writing and debugging programs, iteration, recursion, arrays, lists
- Data Structures and Algorithms: Basic data structures, search and sort, algorithm analysis

Applicants lacking this background may take the Refresher boot camp to acquire it.

A GRE score is not required.

Program Outcomes:
- Be able to acquire, clean, and manage massive data sets.
- Play an analytical role in your company where you design, implement, and evaluate advanced statistical models and approaches for application to your company's most complex problems.
- Be able to provide econometric and statistical models for a variety of problems including projections, classification, clustering, pattern analysis, sampling and simulations.
- Research new ways for predicting and modeling end-user behavior as well as investigating data summarization and visualization techniques for conveying key applied analytics findings.
- Apply modern artificial intelligence and deep learning methods to complex prediction and recognition tasks.

Tuition + fees for ALL students (independent of residency and visa status) at 2020-21 rates, assuming two courses per consecutive semester:

Fall semester: $6,522. Spring semester: $6,522. Summer semester: $5,577.

Total tuition + fees for degree: Fall start: $31,665. Spring start: $30,720. Summer start: $30,720.

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