Online Master of Science in Analytics
Course Descriptions

Current Courses

**CS 6400: Database Systems Concepts and Design**
Study of fundamental concepts with regard to relational databases. Topics covered include database design, query processing, concurrency control, and recovery. Credit not given for both CS 6400 and CS 6754.

**CS 7641: Machine Learning**
Machine learning techniques and applications. Topics include foundational issues; inductive, analytical, numerical, and theoretical approaches; and real-world applications.

**CSE 6040: Computing for Data Analytics**
Computational techniques needed for data analysis; programming, accessing databases, multidimensional arrays, basic numerical computing, and visualization; hands-on applications and case studies. Credit is will not be awarded for both CSE 6040 and CX 4240.

**CSE 6220: High Performance Computing**
This course will introduce students to the design, analysis, and implementation of high performance computational science and engineering applications.

**CSE 6242: Data and Visual Analytics**
The course introduces students to analysis and visualization of complex high dimensional data. Both theory and applications will be covered including several practical case studies.

**ISYE 6414: Regression Analysis**
Simple and multiple linear regression, inferences and diagnostics, stepwise regression and model selection, advanced regression methods, basic design and analysis of experiments, factorial analysis.

**ISYE 6501: Introduction to Analytics Modeling**
An introduction to important and commonly used models in Analytics, as well as aspects of the modeling process.

Future Courses

**ISYE 6644: Simulation**
Covers modeling of discrete-event dynamic systems and introduces methods for using these models to solve engineering design and analysis problems.

**MGT 6203: Data Analytics in Business**
Teaches the scientific process of transforming data into insights for making better business decisions. It covers the methodologies, algorithms, and challenges related to analyzing business data.

**MGT 8803: Introduction to Business for Analytics**
An accelerated introduction to the basics of management and the language of business. The course provides a framework that will enhance a person’s effectiveness in the business world.

**CS 7450: Information Visualization**
Study of computer visualization principles, techniques, and tools used for explaining and understanding symbolic, structured, and/or hierarchical information. Includes data and software visualization. Students cannot receive credit for both CS 7450 and CS 4460.

**CSE 6140: Computational Science and Engineering Algorithms**
This course will introduce students to designing high-performance and scalable algorithms for computational science and engineering applications. The course focuses on algorithms design, complexity analysis, experimentation, and optimization, for important science and engineering applications.

**CSE 6240: Web Search and Text Mining**
Basic and advanced methods for web information retrieval and text mining: indexing and crawling, IR models, link and click data, social search, text classification and clustering.
CSE/ISYE 6740: Computational Data Analytics  
(Machine Learning)
Theoretical/computational foundations of analyzing large/complex modern datasets, including the fundamental concepts of machine learning and data mining needed for both research and practice. Cross-listed with CSE 6740.

CSE/ISYE/MGT 6748: Applied Analytics Practicum
Practical analytics project experience applying ideas from the classroom to a significant project of interest to a business, government agency, or other organization.

ISYE 6402: Time Series Analysis
Basic forecasting methods, ARIMA models, transfer functions.

ISYE 6404: Nonparametric Data Analysis
Nonparametric statistics and basic categorical data analysis.

ISYE 6413: Design of Experiments
Analysis of variance, full and fractional factorial designs at two and three levels, orthogonal arrays, response surface methodology, robust parameter design for production/process improvement.

ISYE 6420: Bayesian Statistics

ISYE 6650: Probabilistic Models
An introduction to basic stochastic processes such as Poisson and Markov processes and their applications in areas such as inventory, reliability, and queuing.

ISYE 6669: Deterministic Optimization
An introduction to deterministic optimization methodologies including approaches from linear, discrete, and nonlinear optimization including algorithms, computations, and a variety of applications.

ISYE 7406: Data Mining and Statistical Learning
Topics include neural networks, support vector machines, classification trees, boosting and discriminant analyses.