

## Master of Professional Studies in Data Analytics

### Core Curriculum (9 credits)

Title	Description	Credits
Foundations of Predictive Analytics	Survey course on the key topics in predictive analytics.	3 credits
Data Mining	Practical benefits of data mining will be presented; data warehousing, data cubes, and underlying algorithms used by data mining software.	3 credits
Applied Statistics	Descriptive statistics, hypothesis testing, power, estimation, confidence intervals, regression, one- and 2-way ANOVA, Chi-square tests, diagnostics.  Prerequisite: one undergraduate course in statistics	3 credits

### Prescribed Courses (9 credits)\* )

Title	Description	Credits
Large-Scale Database and Warehouse	Examination of large-scale data storage technologies including NoSQL database systems for loosely-structured data, and warehouses for dimensional data.	3 credits
Data-Driven Decision Making	Application and interpretation of analytics for real-life decision making.	3 credits
Database Design Concepts	The requirements capture, design, and development of relational database applications; analysis of business requirements and development of appropriate database systems.	3 credits

### Elective (Choose 9 credits)\*

Title	Description	Credits
Data Collection and Cleaning	Tools and techniques required for data collection and computational procedures to automatically or semi-automatically identify and eliminate errors in large datasets.	3 credits
Data Visualization	This course provides a foundation in the principles, concepts, techniques, and tools for visualizing large data sets.	3 credits

Enterprise Analytics Strategies	The course examines business intelligence in the era of big data. Emphasis is on the successful implementation of big data in large and small corporations that deliver extraordinary results.	3 credits
Applied Data Mining	Functional overviews of algorithms used in data mining will be presented and contemporary data mining software used to conduct a project.	3 credits
Statistical Analysis System Programming	Introduction, intermediate, and advanced topics in SAS.  Prerequisite: 3 credits in statistics	3 credits
Regression Methods	Analysis of research data through simple and multiple regression and correlation; polynomial models; indicator variables; step-wise, piece-wise, and logistic regression.	3 credits
Analysis of Variance and Design of Experiments	Analysis of variance and design concepts; factorial, nested, and unbalanced data; ANCOVA; blocked, Latin square, split-plot, repeated measures designs.	3 credits
Genetic Algorithms	Application of genetic algorithms to problems in engineering and science including combinatorial optimization, multi-criteria optimization, biology, chemistry, and neural networks.  Prerequisite: completion of a course in data structures and algorithms or with permission from the program	3 credits
Technical Project Management	Analysis and construction of project plans for the development of complex engineering products taken from a variety of problem domains.	3 credits
Decision and Risk Analysis in Engineering	Analysis of engineering decisions under uncertainty; problem identification, formulation, judgment, resolution; mitigation, risk analysis, quantification, and management.	3 credits

### Capstone Experience (3 credits)

Title	Description	Credits
Design and Implementation of Analytics Systems	Design and implement data science and analytics systems using contemporary tools and techniques. Choice of project topic mutually determined by student and instructor. Students must complete all core and required courses before enrolling.	3 credits