DATA SCIENCE (DATA)

DATA 101 - Introduction to Data Science (3 Credits)
A hands-on introduction to the field of Data Science and its applications. Covers a wide range of topics to provide an overview of the use of data in different fields. Provides hands-on practice with basic tools and methods of data analysis. Prepares students to use data in their field of study and in their work and to effectively communicate quantitative findings.

DATA 219 - Foundations for Data Science (3 Credits)
Prerequisite: DATA 101. Skills and tools in acquiring, parsing, manipulating, and preparing data for statistical analysis.

DATA 350 - Applications of Databases (4 Credits)
Prerequisite: CPSC 225, and grade of C or better in CPSC 240 or DATA 219. Presents basic techniques for the design and implementation of database-driven web applications. Topics include the design of relational and NoSQL databases and scaling techniques such as the use of load balancing and distributed systems. Programming intensive using a dynamic high-level general-purpose language. Cross-listed as CPSC 350.

DATA 352 - Analytics I: Predictive Models (3 Credits)
Prerequisite: STAT 180 or equivalent. This course will introduce students to data visualization methods as well as essential predictive modeling approaches widely used in analytics practice today. Beginning with a foundation in inferential statistics, the course will cover regression, classification, time series, and clustering models. The use of visualization both to explore data and to create narratives around data will also be emphasized. Cross-listed with DSCI 352.

DATA 353 - Analytics II: Optimization Models (3 Credits)
Prerequisite: DSCI 352, MIST 201 or equivalent and STAT 180 or similar statistics course. This course introduces a variety of Management Science models for use in analysis of "business" problems. A computer software package provides the computational basics for case analysis of problem in linear programming, inventory, waiting lines, PERT/CPM and simulation. Cross-listed with DSCI 353.

DATA 370 - Special Topics in Data Science (3 Credits)
Prerequisite: Specified by Instructor. Treatment of selected topics in Data Science. May be repeated for credit with a change in topic.

DATA 401 - Applied Machine Learning (3 Credits)
Prerequisite: Grade of C or better in CPSC 220 or DATA 219 or equivalent. This course develops an overview of the challenges of developing and applying analytics for insight and decision making. Examples and cases will come from customer relation management, price modeling, social media analytics, location analysis and other business domains. Cross-listed as DSCI 401.

DATA 402 - Analytics Applications and Development (4 Credits)
Prerequisite: Grade of C or better in CPSC 220 or DATA 219 or equivalent. A course in programming and data manipulation techniques for constructing analytics-based applications. Topics include SQL or no-SQL databases, using web service API's to acquire data, introduction to Hadoop and MapReduce, and use of third-party analytic component API's. Course previously taught as BUAD 400. Cross-listed as DSCI 402.

DATA 419 - Data Mining (3 Credits)
Prerequisite: DATA 219 or CPSC 220. Practical knowledge of data mining, machine learning, and information retrieval. Students will examine the theoretical foundations of a variety of techniques, gain experience with these techniques using open source software, and learn how to apply them to solve real-world problems. Topics include decision trees, Naïve Bayes, probabilistic retrieval models, clustering, support vector machines, approaches to web mining, and scalable machine learning applications. Cross-listed as CPSC 419.

DATA 420 - Modeling and Simulation (3 Credits)
Prerequisite: DATA 219, CPSC 219, or CPSC 220. A robust introduction to techniques of mathematical modeling and computational simulation applied to practical problems. Topics include system dynamics approaches, discrete-event simulation, and agent-based models. Students complete small projects on topics as diverse as population growth, epidemic transmission, queuing theory, and forest fire outbreaks. Cross-listed as CPSC 420.

DATA 470 - Advanced Special Topics in Data Science (1-4 Credits)
Treatment of selected topics in Data Science. May be repeated for credit with a change in topic.

DATA 491 - Individual Study in Data Science (1-4 Credits)
Prerequisite: CPSC 219 or DATA 219. Individual study in Data Science under the direction of a faculty member in an affiliated department.