ANALYTICS (DATA)

Degrees Offered: Graduate Certificate

The Introduction to Data Science Certificate is an online 16 week graduate program that exposes students to current, cutting edge data programming, statistical modeling and visualization tools through guided, online instruction and applied case studies. This certificate program offers a flexible, short-turnaround time to completion allowing busy employees to participate. Enjoy applied learning in a self--paced but facilitated environment with course instructors and a student success coach.

https://www.unh.edu/analytics/

Programs

- Data Science (Graduate Certificate)

Courses

Analytics (DATA)

DATA 800 - Introduction to Applied Analytic Statistics
Credits: 3
This course is designed to give students a solid understanding of the experience in probability, and inferential statistics. The course provides a foundational understanding of statistical concepts and tools required for decision making in a data science, business, research or policy setting. The course uses case studies and requires extensive use of statistical software.
Grade Mode: Letter Grading

DATA #801 - Foundations of Data Analytics
Credits: 3
This course introduces students to the principles and practice of analytics. The course emphasizes software tools used in the field of data science and covers topics such as data exploration and imputation, linear modeling, time series forecasting, customer segmentation, multivariate techniques and predictive modeling.
Prerequisite(s): DATA 800 with a minimum grade of D-.
Grade Mode: Letter Grading

DATA #802 - Analytical Tools and Foundations
Credits: 3
The course introduces students to the tools used in applications of data analytics programming, data management, visualization, and web analytics. Students learn how to use SAS and R programming as well as data visualization tools in a case analysis based environment. Base SAS programming focuses primarily on data extraction from various sources, web scraping, data cleaning and management. The emphasis is on making students proficient in statistical programming languages like SAS, SQL, R, and Python.
Prerequisite(s): DATA 800 with a minimum grade of D-.
Grade Mode: Letter Grading

DATA #803 - Introduction to Analytics Applications
Credits: 3
The course introduces students to various analytics applications including web analytics, Data Mining, Simulation and Text Mining. Students learn these techniques through hands-on case studies from various industries.
Prerequisite(s): DATA 800 with a minimum grade of D-.
Grade Mode: Letter Grading

DATA #812 - Health Analytics
Credits: 3
This course introduces students to the field of health analytics and data science. It expands upon introductory statistical and data manipulation methods to include data mining, predictive analytics, cluster analysis, trend and pattern recognition, and data visualization. It couples data skills with interpretive and communication skills. Students will also be exposed to basic statistical programming. There will be a graduate component of the course (812) where students will work on advanced concepts and complete a separate culminating project.
Equivalent(s): HMP #812
Grade Mode: Letter Grading

DATA 820 - Programming for Data Science
Credits: 3
In this class, students will build their foundational toolbox in data science: upon completion, students will be able to use the computer from the command line; practice version control with GIT & GitHub; gain a mastery of programming in Python; data wrangling with Python and perform an exploratory data analysis (EDA) in Python. All learning objectives are achieved through active application of these techniques to real world datasets.
Prerequisite(s): DATA 800 (may be taken concurrently) with a minimum grade of D-.
Grade Mode: Letter Grading

DATA 821 - Data Architecture
Credits: 3
In this class, students will learn the foundations of databases and large datasets: upon completion, students will be able to explore out-of-ram datasets though traditional SQL databases and NoSQL databases. Students will also be introduced to distributed computing. All learning objectives are achieved through active application of these techniques to world datasets.
Prerequisite(s): DATA 800 with a minimum grade of D- and DATA 820 with a minimum grade of D-.
Grade Mode: Letter Grading

DATA 822 - Data Mining and Predictive Modeling
Credits: 3
In this class, students will learn foundations of practical machine learning: upon completion, students will be able to understand and apply supervised and unsupervised learning in Python to build predictive models on real world datasets. Techniques covered include (but not limited to): preprocessing, dimensionality reduction, clustering, feature engineering and model evaluation. Models covered include: generalized linear models, tree-based models, bayesian models, support vector machines, and neural networks. All learning objectives are achieved through active application of these techniques to real world datasets.
Prerequisite(s): DATA 800 with a minimum grade of D- and DATA 820 with a minimum grade of D- and DATA 821 (may be taken concurrently) with a minimum grade of D-.
Mutual Exclusion: No credit for students who have taken ADMN 872.
Grade Mode: Letter Grading

DATA #888 - Special Topics
Credits: 3
This course will explore the purpose, design, and analysis of a real-world data science project guided by faculty. Students will be provided a collection of data sets and systematically work through data cleaning, data merging, and the application of a variety of data science methods. The outcome of the course will be an iterative, faculty-guided exploration. The outcomes of the class will be a formal presentation for public consumption using data science visualizations.
Grade Mode: Letter Grading

DATA #896 - Self-Designed Analytics Lab I
Credits: 3
This is the first of a two course self-designed thesis sequence offered under the master's of science degree in analytics. The nature of the class will be applied learning directly around a student directed analytic thesis project. Students will have a choice of either bringing an analytical problem of their interest or one assigned by the instructor out of the ongoing projects in the lab. The student chosen problem will be vetted thoroughly and a decision will be made based on the depth of the proposed data management and analysis proposed submitted in the proposal. Once approved by the committee, the students will collect, clean, merge and create readable analytical files for the project and write a formal 2000+ words report on the data mining part of the project.
Prerequisite(s): DATA #803 with a minimum grade of D-.
Grade Mode: Letter Grading

DATA 897 - Self Designed Analytics Thesis Lab II
Credits: 3
This is the second of a two course self-designed thesis sequence offered under the master's of science degree in analytics. The nature of the class is applied learning directly around a student directed analytic thesis project. The class requires competency in two areas for the successful completion of the course. Students will have completed the data collection, cleaning and management and created readable analytic files for the project of their choice in the first of the two course sequence. Students are primarily responsible to apply modern analytical tools and techniques like predictive modeling, segmentation, and network analysis etc. They are also required to write a formal 2000+ word report on the findings of the project. The report is expected to include modern data visualization synthesized with analysis results.
Prerequisite(s): DATA #803 with a minimum grade of D-.
Grade Mode: Letter Grading

DATA #900 - Data Architecture
Credits: 3
The module-driven course builds off previous introductory analytics coursework and exposes students to advanced level concepts and techniques with respect to big data, data management, architecture, mining, privacy, and security concerns.
Prerequisite(s): DATA 800 with a minimum grade of D-.
Grade Mode: Letter Grading

DATA #901 - Analytics Applications I
Credits: 3
This is the second of the four advanced core courses. This course is partly geared towards analytical business problem solving. This course covers the following broad topics areas: Text Mining, Visualization, Customer analytics and Segmentation, Financial Analytics, Optimization, and Risk analytics. The course is taught by different faculty and industry experts.
Prerequisite(s): DATA 800 with a minimum grade of D-.
Grade Mode: Letter Grading

DATA #902 - Analytics Methods
Credits: 3
This is the third of the four advanced core courses. The module-driven course builds off previous introductory analytics coursework and exposes students to advanced level programming and data management, predictive modeling, experiment design, multivariate techniques, probability and statistical inference.
Prerequisite(s): DATA 800 with a minimum grade of D-.
Grade Mode: Letter Grading

DATA #903 - Analytics Applications II
Credits: 3
This is the last of the four advanced core courses. The module-driven course covers the following broad topic areas: survival analysis, propensity score matching, time series and forecasting, simulation, survey and psychometrics, and web analytics format. This course is taught by a mix of Analytics Program faculty and industry experts.
Prerequisite(s): DATA 800 with a minimum grade of D-.
Grade Mode: Letter Grading

DATA #911 - Analytics Practicum I
Credits: 3
This course introduces students to the practicum project and synthesizes learning from the curriculum into the analysis of their team projects. It includes applied skills in data cleaning, data mining, and analysis, but also professionalization, including business writing, presentation skills and messaging.
Prerequisite(s): DATA 800 with a minimum grade of D-.
Grade Mode: Letter Grading

DATA #912 - Analytics Practicum II
Credits: 3
This course continues the practicum learning experience with teams applying principles and tools to address their assigned project question. In addition, this course continues to develop the professional skills of students culminating in the delivery of a professional team presentation to their sponsor agency of their results.
Prerequisite(s): DATA 800 with a minimum grade of D-.
Grade Mode: Letter Grading

Faculty

See https://gradschool.unh.edu/analytics/faculty-program-team for faculty.