Data Analytics (DATA) Courses

DATA5025 Tools for Data Analytics
This course teaches students without a background in a database and/
or statistical scripting language the concepts necessary to complete the
graduate program in Data Analytics. This course delivers an understanding
of core concepts of database and analytical programming. Students clean,
manipulate and visualize data to solve problems utilizing tools such as SQL
and R.
Offered at Online, Providence
3 Semester Credits

DATA5050 Data Management
This course introduces students to data management by exploring the history
of databases, database concepts and structures, the data project cycle, and
data best practices. Students learn basic SQL skills to gain an understanding
of what is possible with data and build on foundational database concepts.
Throughout the course, focus is also placed on data ethics and its role in
current business issues. Students demonstrate what is possible with data by
completing a project utilizing learned data skills.
Offered at Online, Providence
3 Semester Credits

DATA5100 Statistical Analysis
This course explores how statistics can be used as a powerful tool for
data analysis. Students learn several statistical approaches while using
programming language centered around statistics to work with real data.
Students gain an understanding of the descriptive and inferential statistics
and how they are key concepts in the quantitative analysis of data. Students
demonstrate understanding of topics through practical use case scenarios.
Prerequisite(s): DATA5025 (or concurrent) or permission from the department
chair.
Offered at Online, Providence
3 Semester Credits

DATA5150 Data Mining
This course introduces the theories and tools for intensive data analysis
methods and data-mining techniques such as rule-based learning, decision
trees, clustering, and association rule mining. This course also covers
interpretation of the mined patterns using visualization techniques and
offers students an opportunity to gain the knowledge and experience to
apply modern data-mining techniques for effective large-scale data pattern
recognition and insight discovery. Data analysis software is introduced via
currently used tools in the industry. In addition to expanding upon the
earlier introduced approaches to discerning and validating patterns in
data through sound applications of the scientific method, with a particular
emphasis on hypothesis testing, the notion of statistical significance, and
tests of difference, the goal of this course is to endow students with the
fundamental data management, review, re-engineering, and exploration
skills, as necessary data analytical competencies. Discussions include the main
data-mining methods currently used, including data preparation, cleaning,
testing, training, clustering, classification, association rule mining, decision
networks, and other common data-mining algorithms and techniques.
Prerequisite(s): DATA5025 or permission from the department chair.
Offered at Online, Providence
3 Semester Credits

DATA5200 Data Visualization
This course provides students with the tools and techniques to tell a story
visually with data. Many analysts find great insights in the data but struggle
to successfully deliver their message. The goal of this course is to provide a
foundation to bridge that gap. Students learn visual perception and cognition
concepts through the creation of powerful visualizations using tools like
Tableau and Power BI. This is a project-based course, where students work
with data from exploration to the creation of a dashboard that clearly delivers
its intended message.
Offered at Online, Providence
3 Semester Credits

DATA5300 Big Data Analytics
This course introduces students to the world of Big Data, a world in which
websites, mobile phone applications, credit cards and many more everyday
tools we use extensively collect a tremendous amount of information.
Students learn about the history, current challenges, trends and applications
of these massive datasets. They explore the specialized algorithms for Big
Data analysis, mining and learning algorithms that have been developed
specifically to deal with large datasets. Students learn about techniques
used for managing Big Data such as cloud computing, map-reduce parallel
computing, distributed file systems, No SQL databases, stream computing
engines and other related technologies.
Prerequisite(s): DATA5100.
Offered at Online, Providence
3 Semester Credits

DATA5350 Text & Web Mining Analytics
In this course students dive into the critical intersection of text, programming,
and actionable insights. Specifically, this course covers important topics
in text mining, including basic natural language processing techniques,
document representation, text categorization and clustering, document
summarization, sentiment analysis, social network and social media analysis,
probabilistic topic models, and text visualization.
Prerequisite(s): DATA5100.
Offered at Online, Providence
3 Semester Credits

DATA5400 Introduction to Predictive Modeling
This introductory course focuses on how to use predictive models to analyze
data. Data in the real world involves elements of systematic patterns as
well as uncertainty. The uncertainty may arise from missing information,
measurement error or incomplete sampling of the population. Statistical
modeling methodologies provide a set of tools for understanding data by
incorporating assumptions and prior knowledge. These models are useful for
supporting decision-making in many areas of computer science, including
machine learning, data mining, natural language processing, computer vision,
and image analysis.
Prerequisite(s): DATA5100.
Offered at Online, Providence
3 Semester Credits

DATA5515 Advanced Topics in Predictive Analytics
In this advanced course in predictive analytics, students learn the basic
theory of stationary processes, linear filters, spectral analysis, ARIMA models,
forecasting and smoothing, models for trends and seasonal patterns, and
autoregression and time series regression models. Hierarchically introduced
methods start with terminology and exploratory graphics, moving to
descriptive statistics, and ending with modeling, forecasting procedures and
practical applications. Emphasis is on the practical application of time series
models.
Prerequisite(s): DATA5400.
Offered at Online, Providence
3 Semester Credits

DATA5550 Optimization Simulation
Drawing upon previous coursework in predictive analytics, modeling, and
data mining, this course provides a review of statistical and mathematical
programming and advanced modeling techniques. It explores computer
intensive methods for parameter and error estimation, model selection, and
model evaluation. The course focuses upon business applications of statistical
graphics and data visualization, tree-structured classification and regression,
neural networks, smoothing methods, hybrid models, multi-way analysis,
and hierarchical models. This is a case-study and project-based course with a
strong programming component.
Prerequisite(s): DATA5100.
Offered at Online, Providence
3 Semester Credits

DATA5600 Research Methods in Data Analytics
This course enables graduate students to develop problem-solving, critical thinking and decision-making skills that are important for professionals in all areas of data analytics. Students evaluate quantitative research methods and develop techniques to improve their understanding and evaluation of information. The course examines the research process from problem identification and hypothesis development to data gathering and analysis. Students review pertinent data and literature such as secondary sources, critique published materials, and focus on the nature of empirical research and the elements of research design. Particular attention is given to the student's perspective of the applicability of research to their data analytics careers.
Prerequisite(s): DATA5100.
Offered at Online, Providence
3 Semester Credits

DATA5700 Data Analytics Capstone
This capstone course challenges students to apply theoretical knowledge acquired throughout the program to a project involving actual data in a realistic setting. With faculty guidance, students collect and process data by applying suitable and appropriate analytic methods. Students identify the problem and methodological framework necessary to apply to recommended solutions. At the conclusion of the course, students communicate their findings by presenting to a select group of faculty and/or the client.
Prerequisite(s): Completion of 27 credits in program.
Offered at Online, Providence
3 Semester Credits