

# DATA ANALYTICS (DAT)

## DAT 105 Excel and Modern Technologies 3 credits

This undergraduate course explores essential technologies and software applications pivotal to the modern world. Students will develop proficiency in using Microsoft Excel for data analysis, modeling, and visualization, while also mastering key Office 365 applications such as Word and PowerPoint for professional communication and collaboration. Emphasis will be placed on efficient file storage and organization strategies, ensuring secure and systematic data management. The course will introduce students to graphical user interfaces and their significance in streamlining workflows and enhancing productivity within industrial settings. Additionally, students will gain exposure to current and emerging technologies that foster adaptability and technical fluency in the digital workspace. Practical, hands-on projects and case studies will simulate real-world scenarios, equipping students with skills relevant to contemporary demands.

## DAT 505 Ethical Considerations for Data Analysis 3 credits

Explore real-world information science dilemmas and frameworks to identify ethical problems and reach ethical decisions within the context of analyzing data. This course focuses on the ethical use of data for the purpose of utilizing it to fulfill organizational strategies while at the same time meeting legal, moral and ethical standards.

## DAT 510 Systems Analysis and Design 3 credits

Learn the overall methodology for information systems development and understand the tools used for requirements determination, use case analysis, process modeling and data modeling. This course explores the method for general technology design, user interface design as well as program design. It includes examining how data analytics is used in the preceding tools and processes as both a tool and an intended outcome. This will be accomplished by looking through the lens of operating in a DevOps organization using agile delivery methods.

## DAT 515 Data Visualization & Dashboard Reporting 3 credits

Learn how to prepare data and design meaningful visualizations for effective communication and decision support. Analytical tools such as Tableau, R, and Excel, will be utilized to develop tables, charts, graphs, maps and dashboards for effective data analysis and storytelling.

## DAT 517 Machine Learning for Business Analytics 3 credits

Covers machine learning techniques and their application in business, using tools like Python, R, and Scikit-learn. Topics include supervised and unsupervised learning algorithms such as regression, classification, and clustering. Emphasis is placed on predictive modeling, customer segmentation, and demand forecasting for practical business applications.

## DAT 520 Digital Transformation and Marketing Analytics 3 credits

Explore the five domains of digital transformation: Customers, Competition, Data, Innovation, and Value. This course will examine how to research, gather, evaluate, organize, and analyze consumer data in an effort to create stakeholder value propositions. Students will examine how to launch a new product by using analytical tools as the primary driver for turning data into assets.

## DAT 525 Data Science, Analytics, and Artificial Intelligence 3 credits

This course looks at a managerial approach to understanding business intelligence (BI) systems. Its objective is to help future managers use and understand analytics by providing a solid foundation of BI that is reinforced with hands-on practice. This includes an introduction of business intelligence, data analytics and data science. It explores descriptive, predictive and prescriptive analytics. It identifies big data concepts and tools. It also describes future trends, Analytics and Artificial Intelligence

## DAT 527 Business Analytics and Cloud Platforms 3 credits

Focuses on the processing and analyzing large-scale datasets using cloud computing platforms like AWS, Google Cloud, and Azure. Topics include distributed computing frameworks like Hadoop and Spark, with practical applications in cloud-based data storage, processing, and real-time analytics.

## DAT 530 Quantitative Research and Statistics 3 credits

Learn the overall process of designing a research study from inception to completion and develop an academic literature review associated with a potential topic of interest for the capstone project. Understand hypothesis testing, how to use the appropriate instruments to collect data, and why reliability and validity are so important to the integrity of a research project.

## DAT 535 Programming for Analysts 3 credits

This course in programming provides for a broad range of students who need to work with data. Students will learn basic skills in programs like Python and/or the open-source R statistical package. It introduces the programming of statistical graphics simulation methods, numerical optimization, and computational linear algebra.

## DAT 537 Business Process Automation and Optimization 3 credits

Examines the use of automation tools such as UiPath, Automation Anywhere, and Blue Prism to streamline and optimize business processes. Case studies highlight the impact of automation on reducing manual interventions, improving operational efficiency, and driving cost savings in various industries.

## DAT 540 Business Intelligence and Decision Support Systems 3 credits

This course provides an introduction to decision support systems (DSS) for business intelligence (BI). It looks at decision-making, data components, model components and the use of user interfaces. It explores designing a DSS using object-oriented technologies and implementing it with a recognition of how to evaluate a deployed system. Executive information and dashboards coupled with group decision support systems will be identified.

## DAT 545 Big Data Analytics 3 credits

This class will explore various aspects of big data analytics. Discover tools, technology, applications, use cases and research directions in industry. Initially it will explore challenges in big data and big data analytics. The Big Data Reference Model will be examined. A look at big data analytic tools such as Hadoop, Spark and Splunk will be completed. Looking at predictive models used in analytics and a framework for minimizing data leakage will be explored. Storing big data will be examined plus a study of big data cluster analysis will be done. Finally, non-linear extraction of big data analytics will be described along with data mining and large-scale data clustering.

**DAT 547 Database Management Systems 3 credits**

This course offers an overall understanding of data management by learning how to design, implement and manage databases along with other data management systems. Data modeling, designing relational databases, entity relationship modeling, entity clustering and the use of SQL languages for extracting important datapoints is explored. Students will learn more about distributed database management systems, and data warehouses to create big data capability in support of data analytics, data science and decision-making.

**DAT 550 Advanced Analytics 3 credits**

The ability to predict future events is essential for all industries and tools and techniques used for that purpose will be explored in greater detail. Students will explore and apply skills necessary for topics such as trendline and regression analysis, machine learning, risk analysis and simulation. A better understanding on the use of tools and techniques utilized for data mining, forecasting, and spreadsheet modeling will also be explored.

**DAT 557 Data Mining and Text Analytics 3 credits**

Delves into data mining techniques including association rule mining, decision trees, and clustering, along with text mining using RapidMiner, SAS, and NLTK. Emphasis is placed on extracting patterns, trends, and insights from large datasets and unstructured text, supporting decision-making in areas such as marketing, customer service, and product development.

**DAT 560 Prescriptive Analytics and Optimization Techniques 3 credits**

Covers optimization techniques for prescriptive analytics, using tools like Gurobi, CPLEX, and Excel Solver. Includes decision-making under uncertainty, linear programming, and simulation-based approaches, with practical applications in supply chain optimization, resource allocation, and production scheduling.

**DAT 565 Predictive Analytics and Programming 3 credits**

Focuses on predictive analytics methodologies using tools like Python and R, including time series analysis, neural networks, and regression modeling. Emphasis is placed on forecasting trends and behaviors in areas such as financial forecasting, inventory management, and customer analytics.

**DAT 570 Data Governance, Ethics, and Security 3 credits**

Examines best practices for data governance, ethical data management, and ensuring data security. Tools like Collibra, Informatica, and DataRobot are used to ensure data quality and regulatory compliance, with discussions on GDPR, data privacy, and the ethical implications of data analytics in business.

**DAT 575 Real-Time Data Analytics and IoT 3 credits**

Explores real-time data analysis using Kafka, Apache Flink, and Azure Stream Analytics. Focus is on analyzing streaming data from IoT devices and applying real-time insights to business decision-making in manufacturing, transportation, and smart cities.

**DAT 580 AI-Driven Business Strategies 3 credits**

Covers the integration of artificial intelligence into business strategies using tools like TensorFlow and Keras. Focuses on leveraging AI models to automate decision-making, enhance customer experiences, and drive innovation in business operations. Topics include deep learning, AI ethics, and applying AI to gain competitive advantages.

**DAT 590 Advanced-Data Analytics and Visualization Tools 3 credits**

Explores the use of advanced data analytics platforms such as Tableau, Power BI, and D3.js for creating interactive visualizations and dynamic dashboards. Emphasizes transforming raw data into actionable insights and applying design principles for effective visual communication. Focus is placed on data storytelling and presenting complex analytics results to diverse audiences.

**DAT 599 Data Analytics Capstone 3 credits**

Demonstrate an understanding of data analytics through skills developed in this program. This course will afford students the opportunity to showcase a capstone data analytics project of their choice. Students will identify an issue to be resolved, or an opportunity to be exploited through their analysis. Elements from previous courses will be incorporated for research of a chosen topic and suggest potential solutions or future research to be done. Data will be analyzed and visualizations developed through this process. A faculty panel will judge the final capstone project.