Business Data Analytics

Degrees Offered

• Master of Science

This program is designed to provide students with the ability to perform data analytics in order to enhance business decision making and increase organizational value. The Business Data Analytics degree is particularly attractive to graduating Accounting, Computer Science, Economics, Engineering, Finance, Management, Marketing, Management Information Systems, Math and Statistics students. The degree is also relevant to those already in the workforce, with an emphasis on those already working in the technology/MIS sector, who are looking to broaden their skills and increase their competitive position in the job market. Students can opt to complete the program with a one-year or two-year plan of study. The M.S. in BUDA program is delivered in a hybrid online format with two required residencies. Students will not be required to move to Morgantown, thereby allowing students from a wider geographical area who can remain employed while pursuing the degree. Graduates will understand emerging technology trends in the job market and be well-positioned by way of their strong technology and analytical/quantitative skills. This program is complementary with the University’s goal of transforming curriculum to provide the skills students need to succeed as well as positioning students for career and lifelong success.

Business data analytics, often referred to as “Big Data”, is a rapidly emerging segment in business and industry, and all indications are that it represents one of the fastest growing job markets and has a sustainable future. This program seeks to provide students with the knowledge, skills and tools to successfully compete for a variety of positions in the emerging job market.

FACULTY

CHAIR

• Virginia Franke Kleist - Ph.D. (University of Pittsburgh)
  Professor, Management Information Systems

ASSISTANT PROFESSORS

• Stephane Collignon - Ph.D. (Virginia Tech)
  Assistant Professor, Business Data Analytics

• Brad Price - Ph.D. (University of Minnesota)
  Assistant Professor, Business Data Analytics

PROFESSOR EMERITUS

• E James Harner - Ph.D.

Admission

The Admissions Committee is made up of faculty teaching in the M.S. in Business Data Analytics Program and representatives of the Office of Graduate Programs. The committee members are looking for individuals who have an interest and demonstrated aptitude in quantitative and analytical domains. The committee will take a holistic approach to the admission process and will consider the following factors:

• Undergraduate Degree (students can have an undergraduate degree in a number of areas, undergraduate degrees in the following areas are preferred but not required: engineering, business discipline, math, statistics, computer science, management science, most other sciences, operations research, production/operations management, economics, or industrial/organizational psychology)
• GMAT or GRE test scores in the top 25% (GMAT or GRE waiver can be requested if the applicant has 5 or more years of work experience)
• Strong undergraduate record
• 3 letters of recommendation
• Statement of purpose
• Work experience in the following areas – business intelligence, business analytics, data mining, data warehousing, database management, computer science, programming, web development, web analytics, risk management and related fields – are considered favorably.

If you have any questions, please contact the College of Business and Economics Office of Graduate Programs.

Degree Requirements

The 30-hour online program is comprised of ten courses that collectively expose students to data uses to facilitate business operations and decision making. The introductory course (BUDA 510) helps students understand the role of data analytics in the context of business. The next set of courses (BUDA 515 and BUDA 520) covers the collection of data as well as the building, manipulation and management of large databases. This is followed by a set of courses (BUDA 525, BUDA 530, BUDA 535, BUDA 540, BUDA 545 and BUDA 550) that cover analytical tools that can be applied to the large databases, including statistical, data mining, visualization, and simulation modeling tools. Formal coursework concludes with a capstone course (BUDA 555) that requires students to take the knowledge and skills built in the previous nine courses and apply them to a real-world business problem.
Throughout all ten courses, there will be an overarching emphasis on 1) the application of data analytics to a business context, and 2) the ethical issues surrounding the collection and use of data. The MS in BUDA program also has two residency requirements. The first residency will occur at the front-end of the program. Students will meet and interact with faculty and staff associated with the MS in BUDA program, as well as their fellow students. This will also provide an opportunity to cover the logistics of the program, build networking capacity in the program, and provide an on-campus experience to strengthen the students’ connection to WVU. The second residency will occur at the end of the program. This residency will include presentations by student teams of their capstone project and a recognition/celebratory event surrounding completion of the program.

A minimum cumulative GPA of 3.0 is required.

BUDA 510 Foundations of Business Intelligence 3
BUDA 515 Ethics and Data Collection 3
BUDA 520 Data Management 3
BUDA 525 Business Statistical Methods 1 3
BUDA 530 Business Statistical Methods 2 3
BUDA 535 Business Data Mining 3
BUDA 540 Decision Sciences and Analytics 3
BUDA 545 Business Simulation Modeling 3
BUDA 550 Business Data Visualization 3
BUDA 555 Business Analytics Practicum 3

Total Hours 30

* Students whose cumulative GPA falls below 2.75 will be placed on academic probation. If the GPA is not brought up to 2.75 by the end of the following semester, the student will be suspended from the MS in Business Data Analytics program. Students who are suspended from the program will not be allowed to enroll in program courses for one year.

Suggested Plan of Study (1-year option)

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Total credit hours: 30

Suggested Plan of Study (2-year option)

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Total credit hours: 30

Major Learning Outcomes

BUSINESS DATA ANALYTICS

The educational goals and objectives of the M.S. in Business Data Analytics are as follows:

• Students will be able to demonstrate expertise in statistical techniques, data mining, utilizing databases, and analytical tools.
• Students will be able to apply data analytics to enhance the decision-making of the firm in performance metrics and measurement, risk indicators, assessment and response, and compliance.
• Students will be able to use business analytics to synthesize data trends and competitive drivers.
• Students will be able to communicate the analysis and findings of an analytics initiative in moving an organization forward.

COURSES

BUDA 510. Foundations of Business Intelligence. 3 Hours.
This course provides the foundations for an understanding of Business Data Analytics, giving an overview of the field by covering key concepts including: foundations and technologies of business decision making, data mining, data warehousing, visual analytics, predictive modeling, text analytics, text mining, sentiment analysis, web analytics, business intelligence decision modeling techniques and solutions, expert systems, knowledge management and future technologies.

BUDA 515. Ethics and Data Collection. 3 Hours.
This course provides the student with data collection skills associated with the use of large-scale data in organizations, including the identification of different existing sources of data in formats spanning both streaming and non streaming as well as unstructured and semi-structured. Emphasis is placed on ethical and legal considerations in data collection and the impact on organizational policies and procedures.

BUDA 520. Data Management. 3 Hours.
This course provides an understanding of database design concepts and logic, including data modeling, database design, and the logic of database queries. In order to analyze data, one must be able to access, organize and query databases. The course focuses on relational databases and queries, but also includes object-oriented databases, large volume databases, database performance, scalability and live streaming considerations.

BUDA 525. Business Statistical Methods 1. 3 Hours.
This course introduces students to the role of statistics in the context of applied business data analytics, providing a foundational review of data and relationships, probability distributions, sampling, hypotheses testing, confidence interval estimation, statistical inference, regression analysis and forecasting techniques. This course provides the foundational groundwork for making informed business decisions.

BUDA 530. Business Statistical Methods 2. 3 Hours.
PR: BUDA 525. This class introduces students to multiple regression, limited dependent variables methods, non-parametric regression, time series analysis and Monte Carlo estimation. This course will allow the student to be prepared to summarize and analyze large-scale data in a manner that facilitates making informed business decisions.

BUDA 535. Business Data Mining. 3 Hours.
PR: BUDA 525. This course introduces students to data mining, or the intelligent analysis and extraction of information stored in data sets by applying statistical, mathematical and artificial intelligence tools. This course provides students with the tools to perform fundamental data mining analyses, along with the ability to formulate and solve business data analytic problems utilizing these tools.

BUDA 540. Decision Sciences and Analytics. 3 Hours.
This course exposes students to the decision sciences analytical tools used to solve business problems. A practical, managerial approach is used, building models that require describing the problem in terms of objectives, decision variables, uncertainties, outcomes, choice criteria, and feasibilities. Students will assess the significance of model outputs, using these to develop managerial insights and action.

BUDA 545. Business Simulation Modeling. 3 Hours.
PR: BUDA 525. This course teaches students to structure business decisions in a manner that clearly identifies relevant variables, parameters and sources of uncertainty, and to build models and design experiments to analyze and simulate the alternatives to arrive at the best business decision. Students will develop the ability to analyze simulation output using appropriate statistical analyses, including stochastic modeling.

BUDA 550. Business Data Visualization. 3 Hours.
PR: BUDA 525. This course introduces students to data and information visualization, including both theoretical and practical aspects. In addition to basic visualization techniques, the course covers the application of multivariate techniques in an environment that includes large data sets. Students are involved in both the creation of visualizations, as well as their interpretation.

BUDA 555. Business Analytics Practicum. 3 Hours.
PR: BUDA 545 and PR or CONC: BUDA 550. This course provides students the opportunity to apply various business analytic tools to data sets embedded in a business or non-profit organization. Students are expected to complete a final project that integrates across the analytic skills of ethical data collection, data management, basic and advanced statistical analyses, data mining, data modeling, simulation and data visualization using a holistic approach.