Business Data Analytics, M.S.

Degree Offered

- Master of Science in Business Data Analytics

Certificates Offered

- Business Data Analysis
- Business Data Science
- Business Data Technology Management
- Business Operations Research

Nature of the Program

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 provides students with a set of tools applicable in every business and industry, for this reason the program is attractive to both recent graduates in entry-level positions and experienced professionals. The certificate programs focus specifically on one slice of the Business Data Analytics and enable students to deeply focus over the course of one or two semesters. Both the M.S. and certificate programs are designed for working professionals with one- and two-year plans of study, and many find they are able to apply the concepts learned to their work before graduation.

The M.S. and certificates in Business Data Analytics are delivered online and may be completed from anywhere in the world. Two residencies are required in the M.S. program: an online residency at the beginning of the program orients students to the program structure, technologies, concepts, and expectations of the program and a live residency at the conclusion of the Capstone project. Capstone presentations are an opportunity to present findings of a Capstone project to the sponsoring company. Corporate Capstone participants represent a broad range of industries, including banking, government contracting, manufacturing, and healthcare.

M.S. Business Data Analytics graduates will understand emerging technology trends in the job market and be well-positioned, by way of their strong technology and analytical and quantitative skills, for career and lifelong success. Data analytics 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.

Academic Standards

In addition to the University's academic and professional standards (http://catalog.wvu.edu/graduate/enrollmentandregistration/), students enrolled in a John Chambers College of Business and Economics master's degree program must also abide by the following standards:

- Students must have a minimum cumulative GPA of 3.0 to earn a degree from their graduate program, without exception.
  - A student who cannot mathematically meet the 3.0 GPA requirement to successfully complete the degree, within a reasonable period of time (as defined by the Program Coordinator or designee), will be dismissed from their academic program. Visit the Probation, Suspension, and Dismissal (http://catalog.wvu.edu/graduate/enrollmentandregistration/#probationsuspensiontext) section of the University's Graduate Catalog for more information about this topic.

- Students must follow the professional standards established by their degree program and/or department. A student who violates the established professional standards may be placed on probation, suspended, or dismissed from their program.
  - A student whose cumulative GPA falls below 2.75 will automatically be placed on academic probation.
    - A student will be suspended from their program, for up to one year, if their GPA is not raised to 2.75 by the end of their subsequent semester of enrollment. The program will reevaluate the student after the term of suspension to determine whether they may return to the program or be dismissed.
  - A student will be suspended from their program if they earn a letter grade below C- in more than one required course.
  - A student who earns a letter grade of D or F in any required course must repeat the course and earn a minimum letter grade of C-.
    - Any grade earned in a repeated course at the graduate level is included in the calculation of a student's overall and major GPA, along with the original grade earned in the course. Additionally, the original grade earned in the course will remain on the student's academic transcript/permanent record. Visit the Grades (http://catalog.wvu.edu/graduate/advisingcoursedegrees/advising_and_evaluation/#gradestext) section of the University Graduate Catalog for more information about this topic.

Any exceptions to the above standards must be approved in writing by the Associate Dean for Graduate Programs and Global Engagement and the Program Coordinator.
FACULTY

COORDINATOR
• Janet Fraser - Ph.D. (Pennsylvania State University)
  Teaching Assistant Professor, Business Data Analytics

ASSOCIATE PROFESSOR
• Stephane Collignon - Ph.D. (Virginia Tech)
  Associate Professor, Management Information Systems

ASSISTANT PROFESSORS
• Brad Price - Ph.D. (University of Minnesota)
  Assistant Professor, Management Information Systems
• Jeongsub Choi - Ph.D. (Rutgers)
  Assistant Professor, Management Information Systems
• Bin Liu - Ph.D. (Rutgers)
  Assistant Professor, Management Information Systems

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

• Undergraduate Degree: students can have an undergraduate degree in any field, but the Admissions Committee looks for strong undergraduate records in quantitative, analytical, and/or programming coursework. Successful students come from many academic backgrounds.
• Applicants must provide one letter of recommendation from an individual who can provide information about their academic promise, ability to work with others, professionalism, and potential to succeed in this program.
• Statement of purpose outlining your interest and unique qualifications for the program
• Work or additional 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.

The Admissions Committee reviews applications on a rolling basis, and students admitted to the program may begin in the fall semester. Please visit this program’s webpage (https://business.wvu.edu/academics/management-information-systems/business-data-analytics-certificates/) to learn more about the specific application deadlines and other important information. Students may also contact the John Chambers College of Business and Economics Graduate Programs Office for assistance at (304) 293-5505 or BeGradPrograms@mail.wvu.edu.

Admission Requirements 2023-2024
The Admission Requirements above will be the same for the 2023-2024 Academic Year.

Major Code: 2159

* Note- International Students are required to submit a TOEFL, IELTS, or Duolingo score. The John Chambers College of Business & Economics TOEFL requirement is higher than the University’s—applicants must have a TOEFL-ibt score of 92. If you have taken the IELTS, the minimum score must be 6.5, and the minimum Duolingo score is a 105. English language exam scores should be sent to the Office of Admissions, West Virginia University, PO Box 6009, Morgantown, WV 26506-6009.

All graduate programs in the John Chambers College of Business and Economics require that enrolled students maintain a minimum cumulative GPA of 3.0 in coursework applied toward their degree program, as outlined in the specific academic program of study. Students must also have a minimum cumulative GPA of 3.0 to earn a graduate degree from their respective program.

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 virtual 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 and build networking capacity. 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 program GPA of 3.0 is required by the Chambers College.

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tr>
<td>BUDA 510</td>
<td>Foundations of Business Intelligence</td>
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<td>BUDA 515</td>
<td>Ethics and Data Collection</td>
<td>3</td>
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<td>BUDA 520</td>
<td>Data Management</td>
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<td>BUDA 525</td>
<td>Business Statistical Methods 1</td>
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<td>BUDA 530</td>
<td>Business Statistical Methods 2</td>
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<td>BUDA 535</td>
<td>Business Data Mining</td>
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<td>BUDA 540</td>
<td>Decision Sciences and Analytics</td>
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<td>BUDA 545</td>
<td>Business Simulation Modeling</td>
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<td>BUDA 550</td>
<td>Business Data Visualization</td>
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<td>BUDA 555</td>
<td>Business Analytics Practicum</td>
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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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<td>BUDA 525</td>
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Total credit hours: 30

**Suggested Plan of Study (2-year option)**

**First Year**

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Total credit hours: 30

**Second Year**

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<td>BUDA 545</td>
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</table>

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.
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.

BUDA 595. Independent Study. 1-9 Hours.
Faculty-supervised study, reading, or research.