Master of Science in Business Administration with a concentration in Business Analytics

Curriculum

The MSBA-BA was developed and it is offered by the Pamplin College of Business and supported by the Pamplin College’s Center for Business Intelligence and Analytics. The program is designed to give students the necessary business knowledge, technical expertise, and professional skills to be effective business analytics practitioners. The program requires the completion of 30 credit hours. Students who have fulfilled the prerequisite requirements (i.e., individuals with basic skills in statistics, computer programming and database management) can normally complete the degree in 12 months.

The MSBA-BA offers students with undergraduate degrees from various disciplines the opportunity to obtain a graduate business degree with a specialization in business analytics. Students learn quantitative modeling techniques for descriptive, predictive, and prescriptive analytics. They also gain knowledge about how business and industry uses analytics to frame and solve problems in marketing, operations, finance, information technology, human resources and accounting.

Admission

Admission to the program is competitive with selection based on leadership and communication skills, motivation, quantitative aptitude, and computing experience. The program recruits and select students from a wide variety of disciplines and backgrounds. However, successful applicants must possess basic skills in statistics, computer programming and database management. These skills can be documented through testing and/or academic transcripts. It is anticipated that most applicants will be from engineering, statistics, computing, science, and business programs.

The application process includes the following:

- Online application via graduate school [http://graduateschool.vt.edu](http://graduateschool.vt.edu) ($75 non-refundable fee)
- Transcripts
- GRE or GMAT
- TOEFL or IELTS (scores for international students)
- Personal essay
- Two letters of recommendation
- Resume
- Applicant interview (qualified applicants will be contacted to schedule an interview after the online application has been reviewed)
- Cumulative 3.0 GPA is desired
Program Goals

- Prepare students for future leadership positions in technology and business analytics positions.
- Build relationships with innovative companies to provide projects, internships, and jobs for students.

Program of Study

The program of study consists of a core curriculum focused on real-world corporate problems and experiential learning. The multi-disciplinary backgrounds and divergent thinking of students will lead to creative approaches to problem solving through data analytics. All six departments within the Pamplin College of Business will provide core and/or elective courses for the program. Other departments within the university provide elective courses for the MSBA-BA.

Program Overview

The 30-hour program includes a 15-hour Business Core (required for the M.S. in Business Administration). It also includes a 15-hour Analytics Core, including two courses directly related to the capstone project. Depending on one’s academic background, additional electives may be used to replace courses contained in the business core.

Sample Plan of Study

<table>
<thead>
<tr>
<th><strong>Summer 2 Session:</strong></th>
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<tbody>
<tr>
<td>BIT 5724 Managerial Statistics <em>(Business core)</em> <em>(online)</em></td>
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<tr>
<td>SAS Boot Camp <em>(required unless competency proven)</em> <em>(Non-credit, offered one week before fall classes)</em></td>
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**Fall Semester:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACIS 5104</td>
<td>Fundamentals of Accounting <em>(Business core)</em></td>
</tr>
<tr>
<td>BIT 5524</td>
<td>Introduction to Business Intelligence for Analytics <em>(Analytics core)</em> <em>(online)</em></td>
</tr>
<tr>
<td>BIT 5534</td>
<td>Applied Business Intelligence and Analytics <em>(online)</em> <em>(Analytics core)</em></td>
</tr>
<tr>
<td>MKTG 5104</td>
<td>Marketing Policy and Strategy <em>(Business core)</em></td>
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**Spring Semester:**

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<tr>
<th>Course</th>
<th>Description</th>
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<tbody>
<tr>
<td>FIN 5024</td>
<td>Principles of Finance <em>(Business core)</em></td>
</tr>
<tr>
<td>BIT 5424</td>
<td>Advanced Business Information Visualization and Analytics <em>(Analytics core)</em></td>
</tr>
<tr>
<td>MGT 5905</td>
<td>Business Analytics Capstone <em>(Analytics core)</em></td>
</tr>
<tr>
<td>MGT 5314</td>
<td>Dynamics of Organizational Behavior <em>(Business core)</em></td>
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**Summer 1 Session:**

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<th>Course</th>
<th>Description</th>
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<tr>
<td>MGT 5906</td>
<td>Business Analytics Capstone <em>(Analytics core)</em></td>
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Required Core Curriculum

15 Hours - Business Core†:

ACIS 5104 Fundamentals of Accounting
BIT 5724 Managerial Statistics
FIN 5024 Principles of Finance
MGT 5314 Dynamics of Organizational Behavior
MKTG 5104 Marketing Policy and Strategy

†NOTE: Substitutions for business core courses may be made with the approval of the Academic Director. Students must provide transcripts that document completed courses have provided an equivalent proficiency. Students must substitute approved electives to meet the 30 credit hour requirement for the MSBA-BA. Students may petition to substitute other electives not included on the approved list.

In addition to tuition, a supplemental fee of $162.50 per credit hour applies.

15 Hours - Analytics Core and Capstone Project

BIT 5524 Intro to Business Intelligence and Analytics - Overview of business intelligence and analytics technologies and their strategic use including defining/framing the business context for decisions, decision models, data issues, business intelligence, building analytics capability, cloud computing, making organizations smarter, and measuring the value of analytics.

BIT 5534 Applied Business Intelligence and Analytics - Development of business intelligence and analytics solutions and applications to various types of decision-making problems. Analytics software and techniques. Data preparation, data exploration and visualization, predictive analytics techniques, text analytics, spatial analytics.

BIT 5424 Advanced Business Information Visualization for Analytics - Study of the perception and design principles and advanced techniques for information visualization, with an emphasis on the application of visualization software for data exploration and the development of analytical skills for business. Includes hands-on exposure to information visualization and statistical software.

MGT 5905-5906 Business Analytics Capstone - Management and execution of business analytics projects. 5905: Problem and scope definition, identifying objectives, data requirements and preparation, selection of software tools, project planning and administration, leadership and team building, and assessment of project value and effectiveness. 5906: Student teams apply skills to the completion of real-world projects requiring the integrated application of analytics knowledge, techniques, and tools resulting in the development and delivery of insights, recommendations, and expected outcomes to corporate stakeholders in professional communications, presentations, and reports.
Approved Electives

ACIS 5504 Information Systems Design and Database Concepts - This course is an introduction to design methodologies in information systems. Structured systems analysis and design methodologies are discussed. An introduction to database design methodologies is also included. Topics related to different database models and their implementation is discussed. Students are also required to design and implement information systems using appropriate computer software. Pre: MBA/MACCT standing.

ACIS 5524 Advanced Data Management Systems - This course relates database theories and practices to concepts from other areas, such as programming languages, algorithms, data structures, and information systems. The relational, network, and hierarchical models are introduced. A major portion of the course deals with data manipulation languages for the relational model, design theory for relational databases, and query optimization. Prerequisite(s): ACIS 4514 (UG) OR ACIS 4514 OR ACIS 4515 (UG) OR ACIS 4515 OR ACIS 5504

BIT 5474 Computer-Based Decision Support Systems - This course explains the characteristics, use, and development of decision support systems (DSS) within the context of other business information systems. The process of designing and implementing decision support systems in business is discussed from both theoretical and practical standpoints. Students will learn various ways of measuring the success of DSS implementation as well as the difficulties associated with all such measures. Students will learn to use common software tools to develop DSS.

HTM 5564 Information Technology and Business Analytics for Hospitality and Tourism - Widely used information systems in operation, management, and e-business in hospitality and tourism. Emerging analytics tools for business intelligence and strategic decision-making. Impacts of IT on organizations and the industry as a whole.

HTM 5574 Revenue Management for Hospitality Services - Dynamic forecasting of supply and demand, customer relationship management, services production, pricing, promotion, and distribution. Implications for human resources and information systems management. Application and integration of revenue and customer centric management theory.

MKTG 4264 Analytics for Marketing - The course integrates conceptual and quantitative aspects of marketing. Students will learn the role of analytical techniques and computer models in enhancing marketing decisions, and techniques used in identification, assessment, and forecasting market opportunities.

MKTG 5154 Research for Marketing Decisions - The course encompasses: problem formulation, research design, data gathering instruments, scaling, sampling, data analysis for making marketing-related decisions, and solving marketing-oriented problems.

STAT 5615 Statistics for Research - Concepts in statistical inference, including basic probability, estimation, and test of hypothesis, point and interval estimation and inferences, simple linear regression, one-way analysis of variance, and categorical data analysis.
STAT 5616 Statistics for Research: Experimental designs: basic concepts; completely randomized designs; randomized complete block designs; balanced incomplete block designs; Latin square designs; factorial treatment designs; mixed effects designs; split-plot designs. Multiple linear regression: general formulation, estimation and inference, variable selection, and model diagnostics. Pre: 5615: 1-year calculus; 5616: 5615(3H, 3C). 5615: I 5616: II.

Business Acumen

Students receive instruction focused on teamwork, leadership, and skills in communication, presentation, and project management during the two capstone classes. These topics will be reinforced and students' skills will be enhanced by interactions with the corporate advisors on their capstone projects.

Career Services

MSBA-BA students receive career services advisement during the program to help them prepare a career search strategy. Corporate advisors of the program will also interact with students to ensure they are equipped with appropriate skills to become leaders in business analytics. The MSBA-BA students will have specific career events during the year to network with interested employers.

About the Capstone Project

The capstone project is the cornerstone activity of the Master of Science in Business Administration with a concentration in Business Analytics (MSBA-BA) program. It is essential to the experiential learning that takes place during the intensive year-long curriculum. Students collaborate in interdisciplinary, four-to-five member teams on a project that has significant strategic importance to our corporate affiliates. At the end of the project, students prepare a professional consulting report that summarizes and supports their findings and builds a business case for their recommendations. They also make formal business presentations to the corporate affiliates. This experience will not only enhance students' technical skills, but also provide business acumen that facilitates execution of those skills.
Contact us for additional information:

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