



## GRADUATE CERTIFICATE IN BUSINESS ANALYTICS

### WHY GRADUATE STUDIES IN BUSINESS ANALYTICS?

Analytics allows organizations to collect and process massive amounts of data – commonly called “big data” – in order to extract usable knowledge. Driven by advances in technology systems, analytics is a rapidly expanding field that is creating new career options. From finance to manufacturing, organizations are eager for the knowledge that exists in their enormous databases, but they lack the highly skilled professionals to fill this gap.

By establishing the Graduate Certificate in Business Analytics (GCBA), Bryant continues its leadership role in analytics education. Intended for students who hold a recognized undergraduate degree, this four-course, part-time program will teach you to analyze real-world data provided by strategic partnership organizations, gain experience with advanced tools from companies such as **SAS®** and **Teradata®**, and focus on the application of analytics to practical problems.

Working with faculty members from Bryant’s Advanced Applied Analytics Center (AAAC), you will gain an understanding of key areas of applied analytics including: data analytics methods and tools, data warehousing, data mining techniques, predictive analytics, big data, and visualization.

Upon completion of the program, you will receive a joint certificate in data analytics from Bryant University and **SAS**. Three of the GCBA courses may be applied to a Business Analytics specialization in Bryant’s MBA program.

### FUTURE CAREERS, POST-GRAD OPPORTUNITIES

The skills and knowledge you will develop through the Graduate Certificate in Business Analytics will serve you well in virtually every industry, including business; the arts and humanities; and the physical, social, and health sciences.

### APPLIED ANALYTICS FACULTY

Small classes provide close, personal attention, and expert guidance. In addition to being accomplished professionals, Bryant faculty members maintain the highest academic qualifications and regularly publish in scholarly and professional journals.

### ADVANCED APPLIED ANALYTICS CENTER AT BRYANT UNIVERSITY

The mission of the Advanced Applied Analytics Center (AAAC) is to promote and support the broadening relationship between analytics education, research, and the solution of real-world problems.

### ABOUT SAS®

**SAS**, a leading analytics and business intelligence software company, helps customers at more than 70,000 sites to improve performance and deliver value by making better decisions faster.

Among those, more than 3,000 educational institutions worldwide use **SAS** for teaching, research, and administration. Significant support from **SAS** has accelerated the University’s distinctive Applied Analytics curriculum and the work of Bryant’s Advanced Applied Analytics Center, which serves as a hub for the development of interdisciplinary analytics academic programs, research, training, application, development, consulting services, and conferences – all focused on real-world problem solving.

*“Bryant has integrated **SAS Analytics** into coursework for years. The University’s analytics programs are producing the talent employers need to fill a persistent analytics skills gap. Students with **SAS** skills have tremendous opportunities for lucrative careers.”*

Jerry Oglesby  
Senior Director, SAS Global Academic and Global Certification programs

*“Organizations that embrace analytics can make better data-driven decisions.”*

Janet Prichard, Ph.D.  
Professor, Computer Information Systems

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gsb.bryant.edu

### ADMISSION REQUIREMENTS

#### STATISTICS PRIMER

Students who have not completed a university level statistics course and who have not had previous exposure to statistics or quantitative analysis may be required to complete an online, self-paced statistics primer course prior to starting the GCBA program.

### THE CURRICULUM

#### SAS COMPONENT IN COURSES

Each of the required courses will contain sufficient **SAS**® programming material to qualify students for a Bryant/SAS certificate in analytics.

#### AA610 • ANALYTICS METHODS AND APPLICATION

This course serves as an introduction to the field of analytics. It covers the core concepts and applications of analytics in different areas. Students will be exposed to the concepts and tools of analytics, namely, data querying and reporting, data access and management, data cleansing, statistical programming, and statistical analysis of large datasets. Quantitative topics covered include descriptive statistics, regression analysis, forecasting, text mining, and data visualization and mining. Each of these statistical concepts will be applied to real world problems by utilizing case studies and appropriate data sets. We will not focus on formulas; instead we will use the statistical and data mining software packages **SAS Enterprise Guide** and **Enterprise Miner** for much of our analysis. We will also use **SAS Forecast Server** and **SAS Visualization Analytics** where appropriate.

#### AA620 • DATA MINING AND PREDICTIVE ANALYTICS

This course will focus on applying data mining methodologies and predictive analytics tools to extract useful patterns from large bodies of data and on interpreting the results in order to take reasoned action to solve problems. Students will work with large data sets from organizations in several different domains and analyze the data using **SAS Enterprise Miner**. Topics covered include: multiple linear and logistic regression, decision trees, neural networks, cluster analysis, association analysis and text mining. Students will also be introduced to visualization techniques and applications.

#### AA630 • VISUALIZATION AND LARGE-SCALE DATA ANALYSIS

This course is an introduction to the principles and techniques for data management and visualization. In this course, students will learn how data is stored, accessed, and eventually made into visualizations through analysis. Basic components of database systems, and how data is accessed using SQL will be discussed. The design considerations for more comprehensive data storage systems such as Data Warehouses and Hadoop will also be covered. Lastly, the course will discuss visual representation methods and techniques that increase the understanding of complex data. Emphasis will be placed on the identification of patterns, trends, and differences from data sets across categories, space, and time. Topics include multidimensional visualization, tree visualization, graph visualization, and time-series data visualization techniques. Students will also be provided an overview of data warehouse design. In addition to Hadoop, **SAS Enterprise Miner** and **Visualization Analytics** will be used extensively.

#### AA651 • ANALYTICS CAPSTONE

The Analytics Capstone course provides students with the opportunity to apply the knowledge and skills that they have acquired in the Graduate Certificate in Business Analytics (GCBA) program to realistic problems that involve very large data sets (“Big Data”). In addition to using the techniques students have learned in the previous courses, students will be exposed to other important topics related to Big Data such as Hadoop, map-reduce, association rules, large-scale supervised machine learning, streaming data, clustering algorithms, and NoSQL systems (Cassandra, Pig, Hive) as well as **SAS** software packages. The course will culminate with a final project based on a large data set. Students will present the results of their analysis and recommendations to other students in the class and/or to the organization that sponsored the project. Topics in project management will be presented during the course to help students organize their capstone project.

*“Analytics is an essential 21st-century skill for business.”*

V.K. Unni, D.B.A.  
Dean, College of Business

*“Turn information into knowledge and apply it – that’s power.”*

Ernest Almonte '78, '85 MST, '09H, CPA  
Chief Visionary Officer and CEO, Almonte Group LLC  
Auditor General, State of Rhode Island (1994-2010)

