

Data Science and Business Analytics Certificate Data Science and Business Intelligence Certificate

Description

The Helzberg School of Management has launched two graduate-level certificates: one in Data Science and Business Analytics and one in Data Science and Business Intelligence. The programs examine techniques for predictive and descriptive modeling using concepts that integrate statistics, computer science, and business strategy.

These six-course certificate programs help students move beyond Excel and standard SQL reporting, helping them create predictive models and dynamic dashboards. Students will also work with large data sets and mine textual data from social media and websites. All of these technical skills will be delivered with the idea of solving a business problem. Communication of technical models to a non-technical audience will be emphasized in each class.

Position in the Market

Based on McKinsey Institute's analysis there will be a shortfall of 140,000 to 190,000 candidates with "deep analytical" talent, plus a need for an additional 1.5 million data savvy managers by 2018. The Helzberg data science certificates are designed to fall between what an employee would receive by attending a series of one or two day professional workshops and what they would receive by completing a specialty master's degree in analytics (MS in Analytics, MS in Predictive Analytics, etc.).

Audience

- Business analysts, both new and experienced in their industry, who wish to leverage their business knowledge alongside analytic techniques as they move from traditional reporting and analysis to more advanced analytics.
- Computer science professionals who need more experience working with statistical and predictive analytics models.
- Professionals trained in statistics or other quantitative disciplines that have not worked with large data sets or in an application beyond Excel.
- Individuals who are motivated to learn the fast growing field of data science.

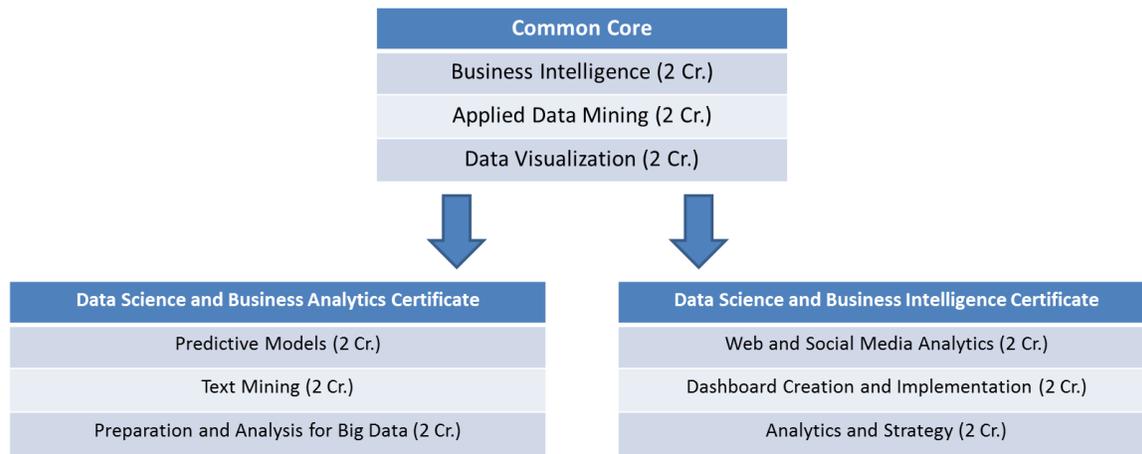
Certificate Design

The Helzberg Data Science certificates will be composed of six courses, which meet one night a week for eight weeks each. A student would typically take one course per 8-week session. The student would complete the graduate certificate program in about 15 months, which includes five, 8-week terms in one calendar year.

We have two certificates available based upon the student’s interests and goals: one that goes more in depth in **Data Science and Business Analytics (DS-BA)** and one that goes more in depth in **Data Science and Business Intelligence (DS-BI)**. The DS-BA certificate studies the technical skills of data science (this is what McKinsey calls “Deep Analytical Talent”). The DS-BI certificate, while preparing students to move beyond Excel and enhance their technical skills, also prepares them to work more at a project and strategic level (this is what McKinsey calls data-savvy managers).

Curriculum Outline

Each certificate includes a six credit hour core and a six credit hour specialization track totaling 12 credit hours. Course descriptions for each course are included later in this document.



At the end of the program, students receive a graduate certificate from the Helzberg School of Management and Rockhurst University. Each course completed will be on the student’s Rockhurst University transcript and the student will have earned 12 graduate credit hours from the Helzberg School of Management. Under certain conditions, many of the credit hours may be applied to the pursuit of a Helzberg School MBA degree. If interested in this option, students must indicate their intent before a certificate is conferred.

Typical Course Design

Each 8-week course will be taught in a workshop format. In each class, a new dataset and method will be used to further understand the valuable information contained in the data. Students will bring their laptops in order to work along with the instructor, gaining hands-on experience then used to complete weekly projects.

All classes will begin with presenting a business question or problem, learning the appropriate applications and methodologies for answering the question, learning to communicate the data and results to a non-technical audience, and discussing how the results can be integrated into an organization’s strategy.

Most classes will have a final project in lieu of a final exam, similar to a complex analysis prepared for a corporate presentation. The student is encouraged to use their own company’s data for each project. If this is not possible, students always have the option

of obtaining data sets from instructors. Students should expect to spend five to ten hours a week outside of class working on data projects

Faculty

Faculty members for this program will be comprised of doctoral educated, full-time professors from the AACSB accredited Helzberg School of Management and practicing experts from industry.

Certificate Prerequisites

The student is required to have completed an accredited bachelor's degree and a basic statistics course. Additionally, students should have exposure to *any* programming language or experience working in a coding environment, and a basic knowledge of SQL.

If a student feels they need a refresher in any of the above, they should contact the program director Dr. Myles Gartland (myles.gartland@rockhurst.edu) who can recommend several options that can be completed prior to beginning the program.

Software exposure in program

The certificate program will be taught using many of the common (typically open-source) tools of data science. They include:

- R & RStudio
- Python with Pandas
- Tableau
- MicroStrategy
- Google Analytics
- MySQL/Oracle/Hadoop

The software used will differ depending on the certificate track.

If a student's company uses a different program for analysis, such as SAS or SPSS, students are welcome to use the alternative program for homework and projects.

Technology

In each class session, students will need to bring a laptop capable of downloading and running the software listed above. The laptop also needs the capability of accessing the university's wireless internet. It is also highly recommended that the person has administrative privileges for their laptop in order to load and modify programs and packages easily. The laptop may be a Windows, Mac or Linux based system. It is highly recommended that the laptop be running a more recent operating system (i.e. Windows 7 and above or Mac 10.8 or above) and have at least 4GB of RAM. Higher amounts of RAM (8 GB or more) is also recommended.

Cost, Dates and Credits

- These courses will at Rockhurst University's Helzberg School of Management located in Conway Hall. The tuition for the certificate program is \$1,260 per 8-week course at 2013-2014 rates. For personal or corporate budgeting, the total cost of the program is

estimated to be less than \$9,000 including all tuition, fees, course materials, and other incidentals.

- With the average cost of a full master's degree around \$40,000, the data science certificates are very affordable options to obtain significant education in this emerging area. Additionally, at \$1,260 per 8-week class, the courses are also more economical than many one and two day workshops.

Application

Students must complete a Helzberg School graduate certificate application, available at <http://www.rockhurst.edu/helzberg-school-of-management/graduate-and-post-mba-certificate-application/>. Official transcripts from all degree granting institutions are required and should be mailed directly from your school to:

Rockhurst University
Graduate Business Programs
Conway Hall, Room 201F
1100 Rockhurst Road
Kansas City, MO 64110-2561

Electronically submitted transcripts are also accepted and may be sent to jennifer.plaster@rockhurst.edu.

Additional Questions? Please contact Erin Standley, Director of Graduate Business Admissions, at 816-501-4632 or erin.standley@rockhurst.edu.

Course Descriptions

BUS 6300 Business Intelligence (2)

Business leaders must have the ability to collect and interpret information concerning customers, suppliers, and competitors, and to make decisions that affect their company's performance. Business Intelligence is a set of methodologies, processes, architectures, and technologies that transforms raw data into meaningful and useful information used to enable more effective strategic, tactical, and operational insights and decision-making with an emphasis on knowledge management. Using the case study approach in combination with contemporary software tools, students will apply the concepts of business process analysis, quality control and improvement, performance monitoring through performance dashboards and balanced scorecards and process simulation.

BUS6301S Applied Data Mining (2)

The course provides a comprehensive overview of data mining techniques used to realize unseen patterns, including traditional statistical analysis and machine learning techniques. Students will analyze large datasets and develop modeling solutions to support decision making in various domains such as healthcare, finance, security, marketing, and customer relationship management (CRM). Models will include decision trees, clustering, classification, k-means, neural nets, support vector machines, ensemble methods and other supervised and unsupervised predictive models primarily for structured data. Students will also learn how to apply these models into production through business rules and SQL. The primary software tools for this class will be R and Python.

BUS6302S Data Visualization (2)

This course is about the interactive exploration of data, and how it is achieved using state-of-the-art data visualization software. Students will be able to present complex quantitative and qualitative data visually. Participants will learn to explore a range of different data types and structures. They will learn about various interactive techniques for manipulating and examining the data and producing effective visualizations. Participants will be guided through an exploration of quantitative business data to discern meaningful patterns, trends, relationships, and exceptions that reveal business performance, potential problems and opportunities. Data visualization is both an art and a science. It is an art concerned with unleashing creativity and innovation, designing communications that appeal on an aesthetic level and survive in the mind on an emotional one. The primary software tool for this class will be Tableau. R and Python will also be incorporated.

BUS6303S Predictive Models (2)

The course will teach advanced statistical techniques to discover information and build predictive models from large sets of data. Emphasis is placed on applications for marketing research and operations. Methods will include multiple and logistic regression, propensity models, principal component analysis, market basket analysis, longitudinal data analysis and product launch models. Students will also be introduced to exporting models into an operational system. The primary software tool for this class will be R. Python and Tableau will also be incorporated.

BUS6304S Text Mining (2)

This course will introduce the essential techniques of text mining, understood as the extension of data mining's standard predictive methods to unstructured text. Students will also learn web scraping techniques and collection of unstructured data from social media sites like Twitter, as well as a company web site. Students will also be introduced to sentiment analysis and natural language processing. The primary software tool for this class will be Python & R. Tableau will also be incorporated. Applied Data Mining or Predictive Models is recommended prior to taking this course.

BUS6305S Preparation and Analysis for Big Data (2)

This course will emphasize the extraction, transformation and preparation of data from traditional relational databases as well as more complex storage systems (such as Hadoop) for analytical purposes. Students will be introduced to data wrangling, munging and scraping of both structured and unstructured data. Students will also be introduced to parallel process for big data such as map reduce and query languages like HIVE. The primary software tool for this class will be Python, specifically using Pandas as well as access to a standard relational database (Oracle or Mysql) and a Hadoop system.

BUS6306S Web and Social Media Analytics (2)

The primary focus of the course is the application of descriptive and predictive techniques to web analytics and other social media platforms including user behavior modeling and e-metrics for business intelligence. Students will also work with Google analytics and other web based analytical platforms to judge performance and ROI of a company's web and social media programs. The primary software tool for this class will be Google Analytics and other web based tools.

BUS6307S Dashboard Creation and Implementation (2)

This course provides instruction for creating analyses and dashboards in business intelligence applications. Students will begin by building basic analyses to include in dashboards, with more complexity as the course progresses. Emphasis is placed using the proper metrics and ways to display them for different users. Dashboards will be built for implementation on both desktops as well as tablet devices. Students will also identify KPIs and how they may be used across different levels of the organization. Examples include human resources, recruiting, sales, operations, security, information technology, project management, customer relationship management and many more departmental dashboards. Students will also be introduced to analytical strategy models like the balanced scorecard. The primary software tool for this class will be MicroStrategy.

BUS6308S Analytics and Strategy (2)

The focus of this class is the implementation of analytics as a competitive advantage across the enterprise. In this course, students will read case studies and hear from guest speakers about challenges and opportunities generated by the advent of "big data." Students will make group presentations and write critical response papers related to these case studies. Students will consider some of the traditional business frameworks (e.g., SWOT analysis) for evaluating the strategic opportunities available to a company in the "big data" space.