SPECIAL REPORT

OF THE

ACADEMIC MATTERS COUNCIL

concerning

CREATION OF CERTIFICATE IN BUSINESS ANALYTICS
(#3812)

Presented at the
771st Regular Meeting of the Faculty Senate
October 12, 2017

COUNCIL MEMBERSHIP

ACADEMIC MATTERS COUNCIL

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ACADEMIC MATTERS COUNCIL

The Isenberg School of Management is proposing to create an Undergraduate Certificate in Business Analytics. Hence, we recommend approval of the proposal.

At its meeting on September 13, 2017, the Academic Matters Council voted unanimously to recommend Faculty Senate approval of the Certificate in Business Analytics. It was submitted as Proposal #3812 in the Course and Curriculum Management System.

MOTION: That the Faculty Senate approve the Creation of a Certificate in Business Analytics, as presented in Sen. Doc. No. 18-003.
Provide a brief overview of the process for developing this certificate.

The process for developing this certificate began in the summer of 2015 when the Undergraduate Programs office in the Isenberg School of Management met with department chairs to discuss the feasibility of offering a Certificate in Business Analytics. A Graduate Certificate in Business Analytics in the Isenberg School was also being considered. Due to capacity constraints, the undergraduate certificate was not proposed at that time. The Graduate Certificate in Business Analytics was approved and started in the fall of 2015. In January 2017, an Undergraduate Certificate in Business Analytics was discussed again with the department chairs and a decision was made to move forward with a certificate given the availability of teaching resources in the analytics area. An analytics task force, with members from each department, was then formed to help to determine the set of core and elective courses that would most benefit Isenberg undergraduate majors. A proposal was developed by the task force and was circulated to the various departments for feedback. Before submitting the proposal for Faculty Senate Approval, it was sent to Associate Dean Tom Moliterno and Dean Mark Fuller for review.

Describe the purpose and the particular knowledge and skills that will be acquired by participating students.

The proposed Certificate in Business Analytics is designed for any student in the Isenberg School with an interest in advancing their knowledge in the area of business analytics and its associated applications (e.g., data retrieval and manipulation, visualization, dashboard design and development, statistical analysis, model development and assessment, data-driven strategic decision-making, context-specific key performance indicators, etc.). The acquisition of this knowledge will enable students to effectively analyze data, make better business decisions, and understand current trends/issues in business analytics.

Describe any additional resources and explain how they will be paid for.

This proposal requires no additional resources as all of the courses will be sourced as follows: (1) through in-load teaching by existing tenure track faculty and instructors; (2) through additional compensation of existing faculty and instructors; or (3) by affiliated experts who are either academically or professionally qualified. Further, planning for this certificate has been underway for two years, and as tenure track and non-tenure track vacancies have been filled, expertise in the area of analytics has been a strong hiring consideration within Isenberg.

Expected enrollment is difficult to gauge, but would be limited to Isenberg undergraduate majors. One core (required) course, OIM 240, has been offered for the past couple of years and has been growing in capacity. Another core (required) course, OIM 350, will be offered in Fall 2017 with a new course number, but similar content has been offered through an existing course for the past few years (OIM 453). The programming core requirement can be satisfied by taking any approved introductory programming course. Three courses are currently approved for this requirement, and include (1) COMPSCI 119 Introduction to Programming, (2) COMPSCI 121 Introduction to Problem Solving with Computers, and (3) MARKETNG 497E Digital Thinking for Marketing and Business. The two computer science courses, use python and java, respectively, and are offered in a large class format. These classes have accommodated many Isenberg undergraduate majors in past years. The Marketing course, is a new experimental course planned for fall 2017 and will include programming with macros in VBA with Excel, and R. Other introductory programming courses that satisfy the programming core requirement may be added by the Undergraduate Dean’s office at a later date.

Please describe the curriculum for this certificate, listing all required courses and possible electives, any prerequisites or GPA requirements, the recommended order or coursework and any other pertinent information. You may attach additional materials related to the curriculum at the end of this section.

Curriculum: This certificate requires a minimum of 15 credit hours as described below.
Core Courses - 9 credit hours required. Students are required to take the two courses listed immediately below, OIM 240 and OIM 350, and should select one of the other three programming courses listed below.

- OIM 240 Business Data Analysis (3 credits)
- OIM 350 Business Intelligence and Analytics (3 credits)

- Programming requirement - Select one course (3 or more credit hours) from the list below
  --MARKETNG 497E Digital Thinking for Marketing and Business (3 credits) VBA macros and R
  --COMPSCI 119 Introduction to Programming (3 credits) Python
  --COMPSCI 121 Introduction to Problem Solving with Computers (4 credits) Java

Elective Courses - 6 Credit Hours. Select from the list of Core and Elective Classes. Classes cannot be used to satisfy both requirements (i.e., classes used to satisfy the core cannot also be used to satisfy the electives).

- FINANCE 304 Financial Modeling
- HT-MGT 392L Special Topics- Information Technology and Social Media in HTM
- HT-MGT 397D ST-Revenue Management and Business Analytics
- HT-MGT 471 Financial Decision Making in Hospitality Business
- MANAGMNT 497R Analytics in Human Resource Management
- MARKETNG 412 Marketing Research
- MARKETNG 455 Internet Marketing
- MARKETNG 465 Retailing Management & Technology
- MARKETNG 491M S-CRM
- MARKETNG 497C Special Topics- Social Media & Marketing Analytics
- MARKETNG 497T Special Topics- Text Mining & Analytics for Marketing and Business Practice
- OIM 451 Information and Project Management
- OIM 452 Business Processes & Enterprise Systems
- OIM 453 Advanced Business Analytics
- SCH-MGMT 397B Internet Technology & e-Business
- SPORTMGT 497D Special Topics-Sport Analytics

Note: Any 1, 2 or 3 credit hour course offered by the Isenberg School of Management or another school/college at UMass Amherst may count as an elective course towards a Certificate in Business Analytics with the approval of the student’s major department chair.

*Explain how these courses represent a coherent course of study.*

The three core (required) courses included in this certificate provide Isenberg students with an essential foundation in data manipulation and exploration, statistics, analytics, and application development in an applied, business context. Students are then prepared to take the elective analytic courses which are offered within their majors, or a related area. The elective courses tend to be more project-based, and these projects utilize the concepts and skills obtained in the three core courses.

*Describe how there is a clear educational objective that can be achieved in an efficient and well-defined manner.*

The educational objective of this certificate is to better prepare Isenberg undergraduate students with the necessary knowledge and skills to obtain internship and permanent positions in business analytics, including business analysts and technology-related consulting, within their chosen business major (e.g., human resources, marketing, sports management, etc.). The five courses (minimum of 15 credit hours)
serve this objective by providing both the necessary foundational knowledge in analytics (core courses), and the major-specific knowledge in analytics (elective courses). The undergraduate certificate in business analytics will provide the students with the sequence of courses they need to pursue a career in business analytics within their chosen major.

*Explain how the course sequence offers a clear objective at the appropriate educational level.*

The three required core courses included in this certificate can be taken simultaneously and do not require any prerequisite courses, by design. Students may take these courses as early as their freshmen year, and will be encouraged to take the three required courses by the end of their sophomore year, in order to be better prepared for internships. Increasingly, companies are hiring business students for internships in the summer after their sophomore year of business coursework, in addition to hiring for internships in the summer after their junior year of business coursework. Upon completing the three required core courses, students will be better prepared for the elective courses offered within their major, or a related area, which require the foundation provided by the three required courses. The elective courses will often include one or more of the three required core courses as prerequisites.

*Describe the perceived need for this certificate.*

Numerous peer and aspirant business schools are now offering certificates, minors and/or majors in analytics. Examples include The Wharton School, University of Pennsylvania (concentration in business analytics), Carroll School of Management, Boston College (co-concentration in business analytics), Georgia Tech (certificate in business analytics), etc. Recent industry articles, including Forbes (2016), Inside Higher Ed (2017), and PwC (2017) note the high demand for business graduates who have the knowledge and skills obtained through analytics programs. Corporate recruiters across all Isenberg majors have also noted the need for students to have more in-depth knowledge and skills in business analytics. Similarly, feedback from exit surveys of recent Isenberg graduates indicates that they feel inadequately prepared in analytics compared to some of their peers in the workplace.

In order for the Isenberg School of Management to remain competitive with peer and aspirant schools in recruiting students, Isenberg needs to offer a business analytics program. Further, in order for Isenberg students to compete on the job market with students from peer and aspirant schools, and to continue to have high placement rates with high salaries, Isenberg needs to offer a business analytics program. This need was recognized back in the summer of 2015 when the Undergraduate Dean’s Office first considered the feasibility of offering such a program. Now, the Isenberg School has been able to secure sufficient resources to offer such a program. The proposed certificate in business analytics addresses these needs in a unique manner, by providing foundational and major-specific analytics knowledge and skills. Isenberg undergraduate students will obtain foundational analytics knowledge through three required core classes and then will be able to apply this knowledge in major-specific analytics courses.

*REFERENCES*


If the courses that comprise the certificate have been or currently are being offered, describe their schedule of availability. If the certificate is comprised of new courses, describe their planned availability.

OIM 240 Business Data Analysis (required) was first offered in 2014, and is now offered regularly in the fall and the spring with several sections offered each semester. This business statistics course is one of three statistics courses that Isenberg students may take to satisfy a three credit hour statistics requirement. Students pursuing the certificate in business analytics will be required to take OIM 240 because it offers the needed statistics in an applied business context using relevant statistical IT tools.

OIM 350 Business Intelligence and Analytics (required) is a course that will be offered under this course number for the first time in the fall of 2017, but the majority of the content has been offered previously under the course number of OIM 453. Several sections of OIM 350 are offered in the fall and spring semesters. This course provides the needed foundation in data manipulation and exploration using several IT tools, including spreadsheets, relational databases, data warehouses, and visualization tools.

Introductory Programming Course (required): Students pursuing this certificate are required to take one of the following programming classes (COMPSCI 119, COMPSCI 121, or MARKTNG 497E). Large sections of the computer science courses are offered each semester and Isenberg students have previously taken these courses. MARKETNG 497E is a new, experimental course which will be offered for the first time in fall 2017 and will be offered again in spring 2018 if there is sufficient interest. Taking one of these courses will provide business students with the needed introductory programming knowledge (e.g., python, R, java, VBA, etc.).

Other Analytics Courses (2 electives required): Students pursuing this certificate are required to take two elective courses (a minimum of 6 credit hours). The list of elective courses provided above is extensive with some courses offered previously and other new courses offered as a result of this certificate. Existing courses that are part of this program will be offered more regularly based on demand, and new elective courses are being developed as experimental, special topics courses.

If the certificate requires or includes courses from outside the sponsoring department, provide evidence of agreement(s) with the unit(s) offering those courses. You may attach any memoranda of understanding below.

A Memoranda of Understanding from the College of Information and Computer Science is attached and addresses student access to introductory programming courses.