STOCKTON UNIVERSITY

School of Business
P: 609.652.4534 • F: 609.626.5539

101 Vera King Farris Drive | Galloway NJ 08205-9441
stockton.edu

March 7, 2018

Dear Colleagues:

The following letter addresses concerns raised during the December 12, 2017, first reading of the business analytics proposal. The first concern raised by the Senate was there a replication of courses with CSIS and the synergy with CSIS. The Senate recommended a meeting with the CSIS faculty.

On December 18, 2017, Dr. Aakash Taneja, Dr. Ellen Kraft, and Dr. Janet Wagner met to discuss concerns with the proposal. Dr. Taneja discussed his concern about the Introduction to Business Data Management. He thought that the business analytics students should take CSIS 3222 Database Management. Dr. Kraft and Dr. Wagner were able to convince him that business students do not meet the pre-requisites of the course as it is listed in the catalog and the Business students in the class would have a much lower level of knowledge since this course was intended to have no pre-requisites in the business analytics curriculum.

Dr. Aakash Taneja and Dr. Ellen Kraft met again on January 26, 2018. During that meeting, Dr. Taneja's concerns were that the students needed to take a course in Python to be competitive for the job market. He recommended that CSIS 2110 Scripting be a required course for the Business analytics curriculum. He also suggested that CSIS 3222 Database Management and CSIS 3XXX Business Data Intelligence be added to the list of electives for the business analytics curriculum.

In response to Dr. Taneja's concerns, Dr. Kraft held a meeting with the task force on February 6. Dr. Kraft, Dr. Wang, and Dr. Zhao met to consider Dr. Taneja's concerns. The task force decided to add a choice of CSIS 3222 Database Management and CSIS 3XXX Business Data Intelligence to the elective pick list.

Dr. Kraft sent the revised proposal to the CSIS faculty. A final meeting with the task force, CSIS faculty, and the Dean occurred on March 1. The following faculty were present- Dr. Aakash Taneja, Dr. Chenyen Xu, Dr. Sitki Gulten, Dr. Ellen Kraft, Dr. Jinchang Wang, and Dr. Shaoping Zhao. The purpose of the meeting was for the task force to listen to the concerns of the CSIS faculty.

Dr. Taneja raised the concern that the program elective for CSIS requires preceptor approval, but no approval is required for ACCT, FINA, MGMT, or MKTG electives. The reason for this requirement is because some courses in CSIS such as CSIS 2259 have overlap with the

business analytics curriculum which would not make them suitable electives. Another concern Dr. Taneja had was that since the Introduction to Business Data Management course would cover SQL Server we would not need CSIS 3222 Database Management. He also believes that information systems courses should be taken by business analytics students. With our current course requirements these courses can be bypassed by our students. Other schools require an introductory technology course which is similar to the course our transfer students take. We also have an elective in Management Information Systems. The final concern raised by both Dr. Taneja and Dr. Xu was that students should be required to take python programming so that they will be competitive for the job market. Our review of 11 business analytics programs revealed that two of them require programming- Manhattan College and Montclair University. Manhattan College's BUAN 205 required object-oriented programming and Montclair University's INFO 366 required Hadoop. Since we were not going to require CSIS 2110 Dr. Taneja said we should remove CSIS 3XXX Business Data Intelligence from the elective pick list since it requires CSIS 2110.

The current proposal includes a 3000 level elective in our pick list and the option to take a 2000 level elective. Both of these electives must be approved by the preceptor. We believe that having these elective choices gives students the flexibility of taking other information systems courses from the CSIS department that would interest them.

We also added an elective course BUSA 3155 Business Applications Programming in Python. This course would fill the gap of not having Python in our program.

The second concern raised by faculty senate was that we did not have an industry analysis to support the program. We have included the results of the Hanover report which support projected growth rates of 4% to 20% in business areas where the analytical skills of graduates are likely to be useful whether nationally, regionally, or in NJ.

A final concern is that we did not make it clear what software skills the students would be learning in each. We have included a table in the proposal to show these skills. We are requesting resources to purchase SQL Server.

Respectfully Submitted,

Ellen M. Kraft, Ph.D.

Associate Professor of Business Studies and Management Track Coordinator

Proposal Template for a New Concentration (Track, Option, or Minor) for
an existing degree program
with the same Classification of Instruction Programs (CIP) Code

Full Name of Current Program: B.S. in Business Studies

Stockton Program Acronym: MGMT

Degree/level of Current Program (BA, BS, MA, MS, MBA, DPT, etc.): BS

CIP Code: 52.02

Name(s) and signatures of Faculty Proposing New Option:

Ellen M. Kraft
Sitki Gulten
Jinchang Wang
Shaoping Zhao

Date of Program Faculty Vote to Approve the Proposed New Option: October 6, 2017

Text Description of Proposed New Option:

Business Analytics Concentration

I. Background

In 2016, the School of Business received accreditation from AACSB. The accreditation process was a lengthy undertaking that lasted nine years and required the input and effort of every faculty and staff member of the business department. A small subset of all business schools in the nation has achieved AASCB accreditation, and it a source of legitimacy for the school for both prospective students and employers. It is also a source of tremendous pride for the business faculty and the University. However, in meetings with the accreditation officers from AACSB, the accreditors made it clear that the current Management curriculum appears dated and will need to be updated, or its accreditation status could be affected. Input from Stockton's advisory board has also directed us to update the curriculum to include a track in business analytics.

II. Purpose

The purpose of the revised curriculum is to provide an undergraduate track in business analytics. The Business Analytics track will provide students with the technology and quantitative skills needed for them

to be able to translate big data into insight and information for efficient business decision making so that organizations can improve their business processes and gain tactical and strategic advantage.

The new curriculum will also support and enhance the School of Business' Critical Thinking and Problem-Solving Learning Goal as well as the Computer Literacy Learning Goal. The new Curriculum will require 32 credit hours.

Staffing will require one full-time faculty line. This position involves teaching Business Analytics and core business courses at the undergraduate and graduate levels, such as Data Visualization, Business Data Management, Data Mining, Data Modeling, Business Applications Programming, and Quantitative Business Methods.

III. Need

The McKinsey Report suggests that by 2018 in the USA the data science industry "...faces a shortage of 140,000 to 190,000 people with deep analytical skills as well as 1.5 million managers and analysts to analyze big data and make decisions based on their findings." According to the US Bureau of Labor Statistics, between 4 and 6 million people are employed as data analysts. Salaries for data analysts start at about $75,000 (Matthew, 2016). Furthermore, companies are viewing data as a strategic asset that they must use to introduce initiatives to benefit their business (Marr, 2015). Hence, there is more of a focus on how to use data as a business strategy making it necessary for managers to know how to use data to implement business strategies.

Business analytics is an interdisciplinary field with applications in health, education, social sciences, and humanities. We have many business minors from different majors in the university making business analytics course offerings beneficial for business minors as well. Students from other majors in the university can take these courses to fulfill the electives in the business minor. Business analytics is an important part of the curriculum for any student because they need to be able to apply critical thinking skills to data analysis as students will be using data in every field.

Business Analytics is a growing field. The table below lists data about business analytics jobs from the Bureau of Labor Statistics. According to the US Department of Labor, the job outlook growth shows that these jobs are growing at a faster than average and much faster than average pace. The advances in technology and market forces are driving the demand for these business analytics related jobs (Morgan, 2016). To stay competitive with other universities that are expanding their curriculums to fill this need Stockton needs to develop a competitive curriculum in business analytics to prepare students for the growing job market.

Table 1: Median Pay and Growth for Business Analytics Jobs

Job Title	Median Pay	Job Outlook Growth
Management/Business Analyst	$81,330	14% (faster than average)
Supply Chain Analyst	$74,170	2% (slower than average)
Operations Research Analyst	$79,200	30% (much faster than average)
Financial Analyst/Risk Analyst	$81,760	12% (faster than average)
Market Research Analyst	$62,560	19% (much faster than average)

Source: Bureau of Labor Statistics, U.S. Department of Labor

The Business Analytics concentration would help prepare students for the Master of Science in Data Science and Strategic Analytics (MS-DSSA) program at Stockton and also Graduate MBA or Masters degree programs in Business Analytics or Data Analytics at a national university. These graduate programs will help students to advance their skills and look for more senior positions with higher salaries.

IV. Industry Analysis

We are using the Hanover New Program Opportunity Analysis as our industry analysis to support the need for the program. A letter from the Dean is in the appendix with more specific detail about her analysis of the report. The analysis of the Hanover Report has linked CIP codes, established by the National Center for Education Statistics (the same CIP codes we put on new courses and use for our IPEDS reporting to the Federal Department of Education). Because Business Analytics is a relatively new area (and CIP codes are only revised once a decade) there currently is no code with the exact title "Business Analytics."

We chose CIP codes that started with 52 because the business analytics track prepares students for the job market by giving them the full business core and then using the track courses to add quantitative and technology skills on top of that sound business foundation

An analysis of the Hanover report for the following codes in the Business area that best align with business analytics (codes starting with 52) uses the following codes

- 52.12 Management Information Systems and Services
- 52.13 Management Sciences and Quantitative Methods

Both codes suggest growth opportunities, with the BLS projections showing expected growth of 6-8% nationally and regionally, and growth (at about 2%) in New Jersey. The completion rate of the Management Science and Quantitative Methods area in New Jersey show that this is a market that other colleges and universities in the state are entering.

Additional analysis of codes which are business areas where the analytical skills of graduates are likely to be useful are:

- 52.0203 Logistics, Materials and Supply Chain Management
- 52.0205 Operations Management and Supervision
- 52.0212 Retail Management
- 52.1402 Marketing Research

We are expecting that Business Analytics graduates would be able to find employment in these areas, All four fields are projected to have strong employment growth, whether nationally, regionally, or in NJ showing projected growth rates of 4% to 20%.

V. The Process

The task force consisted of Ellen Kraft, Sitki Gulten, Jinchang Wang and Shaoping Zhao. We first consulted INFORMS to determine the structure of the curriculum.

The paper, Business Analytics Curriculum for Undergraduate Majors (INFORMS Transactions on Education 15(2):180-187. http://dx.doi.org/10.1287/ited.2014.0134), suggests undergraduate business analytics programs should have six required 3-credit courses and an Analytics practicum capstone course in the following fields:

1) Data Management course without any prerequisite (Topics such as Data Architecture, Metadata, Databases, SQL)
2) Descriptive Analytics course without any prerequisite (Basic stats course explaining descriptive statistics topics)
3) Data Visualization course without any prerequisite (Topics such as Key performance indicators, dashboards, news reports, charts, graphs, etc.)
4) Predictive Analytics course with a prerequisite of the Descriptive Analytics course (Advanced stats course explaining ANOVA, regression, time series, correlation, etc.)
5) Prescriptive Analytics course with a prerequisite of the Descriptive Analytics course (Topics such as Optimization, simulation, etc.)
6) Data Mining with a prerequisite of the Descriptive Analytics course (Topics such as classification, clustering, networks, decision trees).
7) Analytics Practicum Capstone course with a requirement of students finish their coursework before taking this course.

The paper also suggests that a business analytics curriculum should have some Analytics elective courses that should vary based on school requirements. We should also mention that the authors suggest a computer literacy requirement (mainly basic level Microsoft Office proficiency) before students start taking their major courses. Computer literacy is usually a core requirement for all business students in most of the business schools. Even though there is not a specific computer literacy core course at School of Business, some of the core courses partially focus on teaching computer literacy.

After reviewing the INFORMS model, we reviewed curriculum from Montclair State University, Villanova University, LaSalle University, St. John's University, Manhattan College, University of Connecticut, and Rutgers University. We also reviewed business analytics job descriptions and the skills needed for those Hence; we developed our curriculum adapted from the INFORMS model, course descriptions from other universities and skills needed for business analytics jobs. However, we made some changes to the INFORMS model in terms of the number of required courses since we have 4-credits undergraduate course structure at Stockton.

The proposed Business Analytics curriculum is rooted in the existing business curriculum (including all the business core courses) with concentration courses that focus on analytical techniques and their deployment within business settings. The proposed curriculum will have 4-credits required courses in Data Management, Data Visualization, Predictive Analytics, and Data Mining instead of 3-credits as the paper suggested. We believe that this will make our curriculum more rigorous regarding these subjects. The core course CSIS 1206 – Statistics in Business Studies curriculum will be used to satisfy the descriptive analytics requirement. We will work with colleagues in CSIS to make sure that CSIS 1206 will meet this requirement.

We think the prescriptive analytics course should not be a requirement as the paper suggested but it should be an elective course. We discuss the rationale behind this argument in Section V.

Finally, even though the curriculum will not have an individual dedicated capstone course, our proposed 4000-level proposed Data Mining for Managers course will have a capstone project to follow the suggestion done by the paper.

We believe that the proposed curriculum will prepare our students with the necessary and well-known software competencies in the field. The proposed curriculum will help students to learn SQL, R, Advanced Excel, Tableau, and Python.

Table 2: Proposed New Worksheet

B.S. BUSINESS STUDIES			BUSINESS ANALYTICS CONCENTRATION	
Fall 2018-Spring 2019				
BSNS REQUIREMENTS: All BSNS program courses must be completed with a grade of "C" or better.				80 credits
CSIS 1206 Statistics	(4)		BUSA 3XXX Intro. To Data Visualization	(4)
ECON 1200 Macroeconomics	(4)		BUSA 3XXX Introduction to Business Data Management	(4)
ECON 1400 Microeconomics	(4)		BUSA 3XXX Predictive Data Analytics	(4)
ACCT 2110 Financial ACCT	(4)		BUSA 4XXX Data Mining for Managers	(4)
ACCT 2120 Managerial ACCT	(4)		Electives: Pick 3 from: BUSA 3121 Management Information Systems BUSA 3XXX Business Applications Programming in Python BUSA 3XXX Optimization in Business BUSA 3XXX Technology Ethics BUSA/MGMT 3XXX Supply Chain Management MKTG 3490 Marketing Analytics one CSIS 3000 level or above course as approved by the preceptor	(12)
BSNS 2120 Quantitative BSNS Methods	(4)			
MGMT 2110 Intro to Management	(4)			
MKTG 2110 Marketing Principles	(4)		Internship or Elective: Choose from ACCT, ECON, FINA, HTMS, INTL, MKTG, MGMT, PLAW at the 3000 level or above. CSIS courses as approved by preceptor can be used as electives.	(4)
PLAW 2120 Business Law I **OR** PLAW 3110 Legal, Social, Ethical …	(4)			
FINA 3110 Intro to Financial Mgmt*	(4)			
MGMT 3120 Operations Management	(4)			
BSNS 4112 Business Policy & Strategies (seniors only)	(4)		Transfer students may use transferred courses (including Introduction to Business) as "Other Business Courses", to satisfy the minimum number of credits (80) for this area.	

Table 3: Tentative Business Analytics Master Schedule for the Curriculum

Required Courses		F18	SP19	Sum 2019	F19	SP20	Sum 2020
BUSA 3125	Introduction to Data Visualization	1	1		1	1	
BUSA 3XXX	Intro to Business Data Management		1		1	1	
BUSA 3XXX	Predictive Data Analytics				1		
BUSA 4XXX	Data Mining for Managers					1	
Electives		**F18**	**S19**	**Sum 2019**	**F19**	**SP20**	**Sum 2020**
BUSA 3121	Management Information Systems	1			1		
BUSA 3XXX	Optimization in Business					1	
BUSA/MGMT 3XXX	Supply Chain Management		1			1	
BUSA 3XXX	Technology Ethics					1	
BUSA 3XXX	Business Applications Programming in Python						
Total		2	3	0	4	6	

Course Descriptions - Business Analytics Concentration Courses

1. **BUSA 3125 -Introduction to Data Visualization** (No Prerequisite) 4 credits

Description: This is the first course with a comprehensive overview of the fundamental concepts and tools of business analytics for improving business decision making and performance. The major topics discussed are: (i) the process of business intelligence and business analytics, (ii) the core concepts of "big data" management, (iii) the principles of data visualization and dashboard design. Spreadsheet or commercial software such as Tableau is integrated into all topics.

2. **BUSA 3130 - Introduction to Business Data Management** (No Prerequisite) 4 credits

Description: This course introduces the principles and core concepts of data and information management. Topics include identifying organizational information requirements, developing conceptual data models from gathered information, creating relational data models from conceptual data models, and implementing the models. Students will get extensive hands-on experience using current database technologies including SQL.

3. **BUSA 3135-Predictive Data Analytics** (Prerequisite: CSIS 1206) 4 credits

Description: This course introduces the principles of hypothesis testing, chi-square tests, one-way and two-way ANOVA, simple and multiple regression analysis, correlation analysis, nonparametric methods, indices, time series, forecasting, and applications to business. It emphasizes applications to the analysis of business data and makes extensive use of computer statistical packages such as R.

4. **BUSA 4110-Data Mining for Managers** (Prerequisite: CSIS 1206 and Intro to Business Data Management) 4 credits

Description: This course explores the fundamental concepts of data mining and provides extensive hands-on experience in applying the concepts to real-world business applications. Topics include classification, clustering, association analysis, and anomaly/novelty detection. Data mining techniques to applications such as fraud detection, web usage analysis, customer churn analysis, customer segmentation, blog mining, text mining, and other business data analysis will be discussed. This course will include a comprehensive project.

5, 6, and 7. Choose three electives from

- **BUSA 3140 - Optimization in Business** (Prerequisite: CSIS 1206 and BSNS 2120) 4 credits

Description: This course introduces optimization modeling beyond the confines of a two-dimensional spreadsheet. Students learn appropriate mathematical notation for formulating realistic, complex optimization models, and how to translate this notation into a modern modeling language. Students learn to represent given problem data symbolically and separate it from the fundamental model structure. All topics are illustrated on real-world data sets obtained from various disciplines to include accounting, finance, management, sales and marketing, operations, and risk management.

- **BUSA/MGMT 3145 - Supply Chain Management** 4 credits

Description: Supply Chain Management (SCM) is concerned with the efficient integration of suppliers, factories, warehouses and stores so that products and services are distributed to customers in the right quantity, at the right time, with lowest costs. This course explores the key issues associated with the design and management of industrial Supply Chains (SC). Important concepts, principles, and strategies of SCM as well as tools and techniques to solve real SC problems will be included. The course will focus on practice-oriented learning process and enhance analytical and problem-solving skills through discussing and analyzing innovations and cutting-edge research as well as real business cases.

- **BUSA 3150 - Technology Ethics** 4 credits

Description: This course looks at issues of data confidentiality, privacy, transparency, identity theft, security, and protecting organizations data from breaches. Solutions such as laws, Organizational policies, institutional statements of ethics, self-policing, and other forms of ethical guidance are examined.

- **BUSA 3155 - Business Applications Programming in Python** 4 credits

Description: Students will learn computer programming skills and techniques to solve analytical business problems through a series of steps that involve identification of problems, design of the solution logic, formal representation of program specifications, data type and structures, and implementation of the program using Python.

- **MKTG 3490 - Marketing Analytics** 4 credits

Description: Individuals performing the marketing function are under considerable pressure to update their analytic skills to evaluate the effectiveness of marketing actions and expenditures. The Marketing Analytics course examines quantitative techniques that help marketers better plan, implement and analyze marketing strategies and make informed decisions.

- **BUSA 3121 - Management Information Systems-currently MGMT 3121**

Description: The course is intended to provide students in business related disciplines an understanding of the role of MIS in business organizations. The goal is to introduce basic information system concepts that can be useful to the students as a user of information systems and as a decision maker concerned with the acquisition, application, and control of MIS. The course contents consist of an overview of topics and issues in MIS; organizational foundations of MIS; information system technology; organization control and support systems; and managing information systems.

- **CSIS 3000 level elective as approved by the preceptor**

8. **Elective or Internship -** Choose one course (4 credits) at 3000 level or greater from ACCT, ECON, FINA, HTMS, INTL, MGMT, MKTG, or PLAW or Internship (BUSA 4900). CSIS courses as approved by preceptor can be used as electives.

Table 4: Software Skill Taught in Each Course

Course	Software Skills
BUSA 3125 - Introduction to Data Visualization	Tableau and Excel
BUSA 3130 - Introduction to Business Data Management	SQL Server
BUSA 3135 - Predictive Data Analytics	R
BUSA 4110 - Data Mining for Managers	R and SQL Server
BUSA 3140 - Optimization in Business	Excel and Analytic Solver
BUSA/MGMT 3145 - Supply Chain Management	Excel
BUSA 3155 - Business Applications Programming in Python	Python
MKTG 3490 - Marketing Analytics	Excel and Excel add-in ME-XL from Decision Pro http://www.decisionpro.biz/

Curriculum Mapping

Business Studies program has the following learning goals:

1) Communication Skills Learning

    a. Oral communication: graduates will be able to deliver information in a persuasive, logical, and organized manner with a professional demeanor using appropriate supportive visual aids.
    b. Written communication: graduates will know how to create informational, analytical, and technical documents which are organized, precise, and relevant.
    c. Information literacy: graduates will be able to assess the nature, quality, extent, and appropriateness of various sources of information used in preparing oral and written projects.

2) Ethics Learning

    Graduates will be able to communicate effectively in a professional environment.

3) Critical Thinking and Problem-Solving Learning

    Graduates will be able to logically interpret, analyze, and summarize the results of information examined, and will be able to apply appropriate analytic, problem-solving, and decision making skills in business situations.

4) Management-Specific Learning

    a. Graduates will successfully apply basic business principles and theories in a variety of organizational settings.
    b. Graduates will acquire knowledge of current management and administrative practices and theory and be conversant in the language of business.
    c. Graduates will embrace the importance of maintaining a professional attitude and understand appropriate standards of conduct in their chosen field.
    d. Graduates will understand business transactions and how they are organized, recorded, and reported.
    e. Graduates will understand the interrelationships among customers, products, and companies.
    f. Graduates will understand how to manage the flow of funds within organizations.
    g. Graduates will develop an international perspective in order to contribute to a global society and work in a culturally diverse business environment.
    h. Graduates will be able to facilitate interaction with team members and contribute their expertise toward the creation and development of group projects.
    i. Graduates will be able to apply theories and skills of statistical data analysis and management science to support decision-making processes throughout an organization.

5) Computer Literacy Learning

    Graduates will be able to demonstrate a multi-faceted skill set in computer literacy through oral and written communication.

		Business Studies Learning Goals														
		1a	**1b**	**1c**	**2**	**3**	**4a**	**4b**	**4c**	**4d**	**4e**	**4f**	**4g**	**4h**	**4i**	**5**
Required Courses	BUSA 3125 Introduction to Data Visualization					✓										✓
	BUSA 3130 Into. to Business Data Management					✓									✓	
	BUSA 3135 Predictive Data Analytics					✓									✓	
	BUSA 4110 Data Mining for Managers					✓									✓	✓
Elective courses	BUSA 3121 Management Information Systems					✓										
	BUSA 3140 Optimization in Business					✓									✓	
	BUSA 3150 Technology Ethics				✓	✓										✓
	BUSA/MGMT 3145 Supply Chain Management				✓	✓									✓	
	MKTG 3490 Marketing Analytics					✓									✓	
	BUSA 3155 Business Applications Programming in Python					✓										✓

The summary of mapping required and elective courses of the proposed Business Analytics concentrations to Business Studies program learning goals will be as follows:

Stockton University has the following ELOs:

1) Adapting to Change
2) Communication Skills
3) Creativity and Innovation
4) Critical Thinking
5) Ethical Reasoning
6) Global Awareness
7) Information Literacy and Research Skills
8) Program Competence
9) Quantitative Reasoning
10) Teamwork and Collaboration

The summary of mapping required and elective courses of the proposed Business Analytics concentrations to ELOs will be as follows:

		ELOs									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Required Courses	BUSA 3125 Introduction to Data Visualization		✓		✓				✓	✓	
	BUSA 3130 Intro. to Business Data Management				✓				✓	✓	
	BUSA 3135 Predictive Data Analytics				✓				✓	✓	
	BUSA 4110 Data Mining		✓		✓				✓	✓	
Elective Courses	BUSA 3121 Management Information Systems				✓				✓		
	BUSA 3140 Optimization in Business				✓				✓	✓	
	BUSA 3150 Technology Ethics				✓	✓		✓			
	BUSA/MGMT 3145 Supply Chain Management				✓				✓		
	MKTG 3490 Marketing Analytics				✓				✓		
	BUSA 3155 Business Applications Programming				✓				✓		

VI. Prescriptive Analytics (Optimization) as a must course in Business Analytics concentration?

I. Peer Schools' Business Analytics Curriculum

While some research universities have Optimization course as required in their Business Analytics curriculum, most of the Stockton's peer schools have optimization/simulation/decision-making types of courses in their electives.

List of Schools with Optimizations/Simulation/Decision Making course as Required Courses

- Drexel University
- Rutgers University

List of Schools with Optimizations/Simulation/Decision Making course as Elective Courses

- Montclair State University
- LaSalle University
- Manhattan College
- Villanova University
- Rider University

II. Business Analytics Jobs' Requirements

Graduates of Business Analytics major can expect to work as in the following occupations:

- Management/Business Analyst
- Data Analyst
- Supply Chain Analyst
- Operations Research Analyst
- Financial Analyst / Risk Analyst
- Market Research Analyst
- Purchasing Analyst
- Consultant

We researched to find the job descriptions of Business Analyst, Data Analyst, and Supply Chain Analysts jobs by looking at a job recruiting websites such as Linkedin, DataJobs, Indeed.com.

Most common skills required for Business Analyst jobs:

- Basic Database Skills (SQL, MS Access, Data Modeling)
- Advanced Excel Skills (PivotTables, complex formulas)
- Data Visualization Skills (Tableau, MS Excel)
- Strong Analytical and Statistical skills
- Python and R are plus skills

Most common skills required for Data Analyst jobs:

- Advanced Database Skills (SQL, MS Access, Data Modeling)
- Advanced Excel Skills (PivotTables, complex formulas)
- Data Visualization Skills (Tableau, MS Excel)
- Strong Analytical and Statistical skills
- VBA, Python, and R are plus skills

Most common skills required for Supply Chain Analyst jobs:

- Strong Supply Chain knowledge
- Strong Analytical and Statistical skills
- Advanced Excel Skills (PivotTables, complex formulas)
- SAP, SAS, R, Python, and Optimization skills are plus for some advanced level jobs
- Database Skills are plus

<u>Conclusion</u>: Prescriptive Analytics is not a common skill for entry level jobs.

VII. Role of Management Information Systems Course

The existing MGMT 3121 Management Information Systems course is still being kept in the curriculum as an elective. The course will be BUSA 3121. The course serves to provide students with a course to introduce basic information system concepts. There are other schools that offer degrees in Management Information Systems such as Rochester Institute of Technology, Santa Clara University, and Worcester Polytechnic Institute so management information systems is still being taught in universities.

VIII. Python as a Required Course Course

We reviewed programs from 11 colleges and universities. Our review revealed that two of them required programming, Manhattan College and Montclair State University. Manhattan College's BUAN 205 requires object-oriented programming and Montclair State University's INFO 366 requires Hadoop. The title of all of the programs, degrees, or certificates was Business Analytics and were in a School of Business. Table 5 lists the University, school, major and link to degree requirements.

Table 5: List of Business Programs Reviewed

University	School	Major	Link to Course Requirements
Drexel University	Business	Undergraduate Business Analytics Undergraduate Program	http://www.lebow.drexel.edu/academics/undergraduate/areas-of-study/business-analytics http://catalog.drexel.edu/undergraduate/collegeofbusiness/businessanalytics/#degreerequirementstext
Felician University	Business	Undergraduate Business Analytics Program	https://www.felician.edu/academics/academic-programs/business/undergraduate/business-analytics/bs-business-analytics-curriculum-requirements
Kansas University	Business	Undergraduate Business Analytics Degree Program	https://business.ku.edu/degree-programs/undergraduate/bsb/business-analytics
LaSalle University	Business	Business Systems and Analytics Major in the Undergraduate Program	http://www.lasalle.edu/business/programs/undergraduate/business-systems-and-analytics/course-requirements/#.WqCIsuRy6cw
Manhattan College*	Business	Business Analytics Major It is housed in the Accounting, CIS and Law Department	http://catalog.manhattan.edu/undergraduate/business/businessanalytics/
Montclair State University*	Business	Business Administration Major, Business Analytics Concentration It is housed the Information Management and Business Analytics Department.	http://catalog.montclair.edu/programs/business-administration-business-analytics-bs/
Rowan University	Business	Certificate of Undergraduate Studies: Business Analytics	https://academics.rowan.edu/business/undergraduate-programs/certificate-undergraduate-studies.html
Rutgers University	Business	Business Analytics and Information Technology (BAIT) major and Business Analytics concentration inside BAIT	Business Analytics and Information Technology Major http://www.business.rutgers.edu/undergraduate-new-brunswick/business-analytics-information-technology Business Analytics Concentration http://www.business.rutgers.edu/undergraduate-new-brunswick/business-analytics-concentration
St. Johns University	Business	Business Analytics minor in the Undergraduate Business program	https://www.stjohns.edu/academics/schools-and-colleges/peter-j-tobin-college-business/undergraduate-programs
Villanova University	Business	The Business Analytics co-major must be taken in conjunction with a major in Accountancy, Economics, Finance, Management, Management Information Systems or Marketing	https://www1.villanova.edu/villanova/business/undergraduate/degrees/businessanalytics.html Undergraduate catalog: https://www1.villanova.edu/villanova/provost/catalog.html
York College of Pennsylvania	Business	Undergraduate Business Analytics Degree	https://catalog.ycp.edu/preview_program.php?catoid=20&poid=2111&returnto=758

IX. Resources

First, we will need at least one faculty line to start the program. This position involves teaching Business Analytics and core business courses at the undergraduate and graduate levels, such as Business Data Management, Data Mining, Data Modeling, Business Applications Programming, Quantitative Business Methods. The faculty member will have Business/Data Analytics or Data Science, or a related discipline (such as Management Science, Operations Research, Decision Science, Computer Science, Information Systems, Engineering) is required. Candidates should know several of the following: Excel, Access, Tableau, R, SQL, Python, JAVA, and Hadoop. The University must use AACSB Guidelines for making decisions regarding student-faculty loads.

Second, we will need the university to purchase Microsoft SQL Server so that we can use it to teach the Introduction to Business Data Management course.

X. Synergy with other Business Programs

The Business Studies program currently has tracks in management, marketing, finance, and accounting. Business analytics would be the fifth track in the Business Studies program.

Business analytics is important for all areas of the business program. The courses Introduction to Data Visualization and Introduction to Business Data Management do not have any pre-requisites. These courses can be taken as program electives by any student in the business program, thus creating a synergy for electives within the business program. We will also create synergy within the business program by using datasets for our courses from a variety of business disciplines including management, marketing, finance, and accounting.

Business minors could take these courses as well students who would like to take them as ASD (at some distance) electives. The courses work in synergy with other programs in the university such as health sciences, natural science, physical sciences, social sciences, and mathematics in which students need to know how to analyze and model data.

The B.S. in Business Analytics would be a perfect fit for a second degree with the B.A. in computer science. Students choosing this option would be very competitive in the marketplace as they would be combining strong programming skills with business analytics skills. The business analytics concentration has a free elective in which students may take a 2000 level or higher computer science course and a 3000 level CSIS elective choice. The courses in the business analytics concentration could be used as electives

for computer sciences concentrations as well. The computer science program students would gain a competitive edge by taking our courses as electives.

The management concentration will be sharing courses with the business analytics concentration. Supply Chain Management will be available for students in both concentrations as an elective.

The business analytics concentration will also work in synergy with the DSSA and MBA graduate programs. The business analytics program will serve as direct preparation for students to enter the DSSA Master's program. Business analytics is a crucial skill for MBA students. Whether students take business analytics courses or are business analytics majors, these students will be better prepared to enter the MBA program.

XI. Conclusion

The task force recommends to the full MGMT faculty that we create a new track in business analytics (with the curricula as outlined above) with the understanding that implementation details including staffing will need to be worked out before the new track is launched.

The task force does not think that prescriptive analytics course should be a required course because our competitors do not require it and employers do not consider optimization a common skill for entry-level jobs.

The task force recommends that the full MGMT faculty develop a recommendation to the dean about faculty coordination of the new track. The task force recommends that business analytics be a separate track.

XII. References

Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2016-17 Edition*, Management Analysts. Retrieved from: https://www.bls.gov/ooh/business-and-financial/management-analysts.htm

DataJobs, Big Data Salaries: An Inside Look. Retrieved from: https://datajobs.com/big-data-salary

GlassDoor, Data Analyst Salaries. Retrieved from: https://www.glassdoor.com/Salaries/data-analyst-salary-SRCH_KO0,12.htm

Manyika, J., Chui, M., Brown, B., Bughin, J., Dobbs, R., Roxburgh, C., and Byers, A. H. (2011). Big data: The next frontier for innovation, competition, and productivity. Technical report, McKinsey.

Marr, B. (2015, Nov 30). Big Data: Now A Top Management Issue. Retrieved from: http://www.forbes.com/sites/bernardmarr/2015/11/30/big-data-now-a-top-management-issue/2/#6a2bc51021ef

Matthew, G. (2016, Jan. 20). Five Ways Data Analytics Will Shape Business, Sports And Politics. In 2016 Retrieved from: http://www.forbes.com/sites/valleyvoices/2016/01/20/five-ways-data-analytics-will-shape-business-sports-and-politics-in-2016/#220610625a1d

Morgan, L. (2015, December 16). Universities Expand Curriculum To Meet Data Scientist Demand. Retrieved from http://www.informationweek.com/big-data/big-data-analytics/universities-expand-curriculum-to-meet-data-scientist-demand/d/d-id/1323503

O*Net OnLine, Summary Report for Management Analysts. Retrieved from: https://www.onetonline.org/link/summary/13-1111.00

Wilder, C., and Ozgur, C. O. (2015). Business Analytics Curriculum for Undergraduate Majors. *INFORMS Transactions on Education, 15:2*, 180-187.

XIII. Appendix

Letter from Dean Wagner with Industry Analysis

To: Ellen Kraft
From: Jenny Wagner
Re: Hanover Research Info Regarding Business Analytics
Date: 3/7/2018

I am happy to share the entire Hanover New Program Opportunity Analysis dashboard with you (you need Tableau reader to access it, which Computing Services can help you with). But in the interests of time, here are some results for you.

Please note that this tool is linked to the CIP codes, established by the National center for Education Statistics (the same CIP codes we put on new courses and use for our IPEDS reporting to the Federal Department of Education). Because Business Analytics is a relatively new area (and CIP codes are only revised once a decade) there currently is no code with the exact title "Business Analytics".

Knowing that this degree is focused on preparing students by giving them the full business core and then using the concentration courses to add technical skills on top of that sound business foundation I have limited myself to looking at codes in the Business area (that is codes starting with 52).

At the more aggregated level, I've given you the Hanover report for the following codes:

- 52.12 Management Information Systems and Services
- 52.13 Management Sciences and Quantitative Methods

Both codes suggest growth opportunities, with the BLS projections showing expected growth of 6-8% nationally and regionally, and growth (at about 2%) in New Jersey. The completions of the Management Science and Quantitative Methods area in New Jersey show that this is a market that other colleges and universities in the state are tapping into.

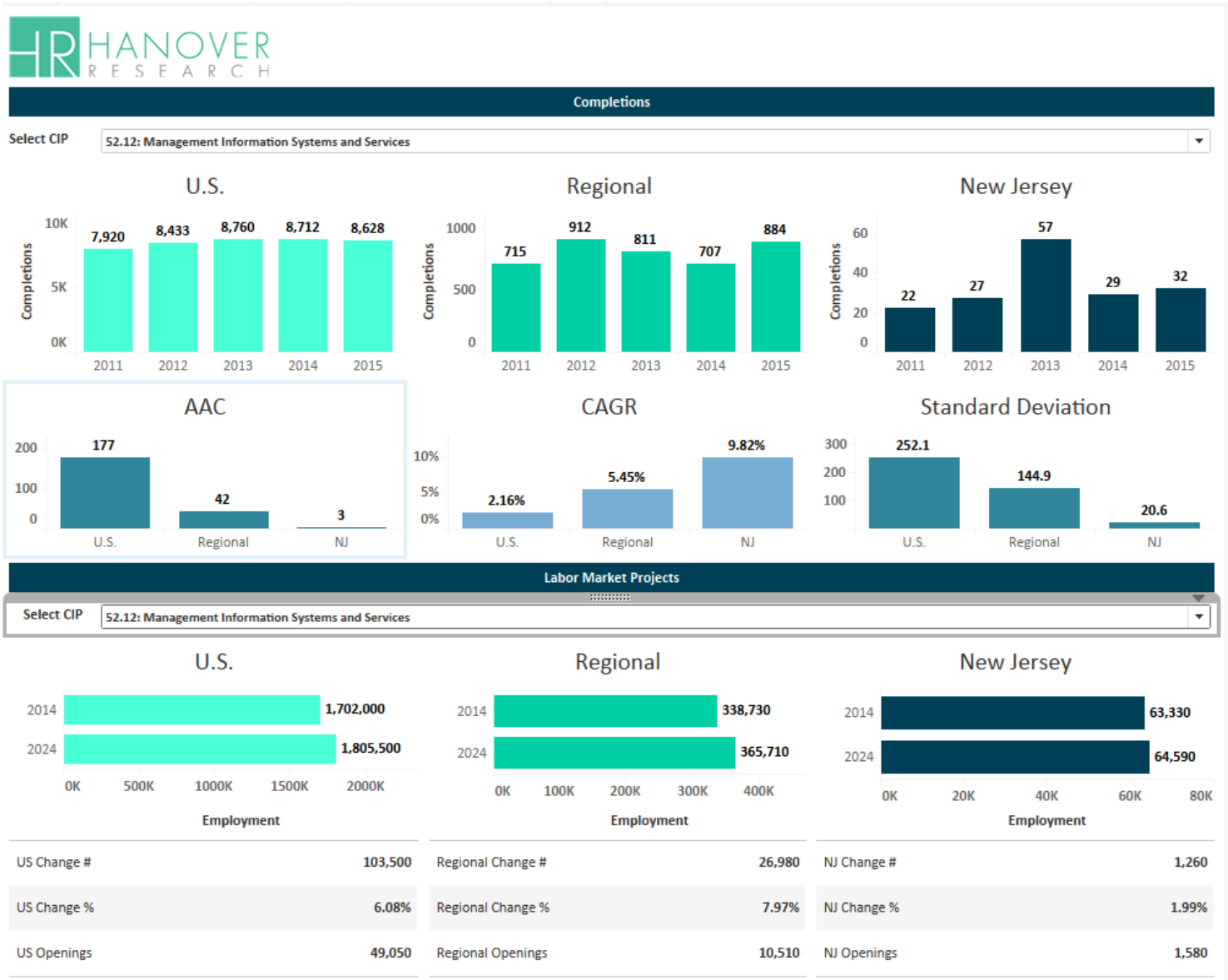
At the more specific method, I've given you the Hanover report for the following codes not in the 52.12 and 52.13 family, which are business areas where the analytical skills are likely to be useful:

- 52.0203 Logistics, Materials and Supply Chain Management
- 52.0205 Operations Management and Supervision
- 52.0212 Retail Management
- 52.1402 Marketing Research

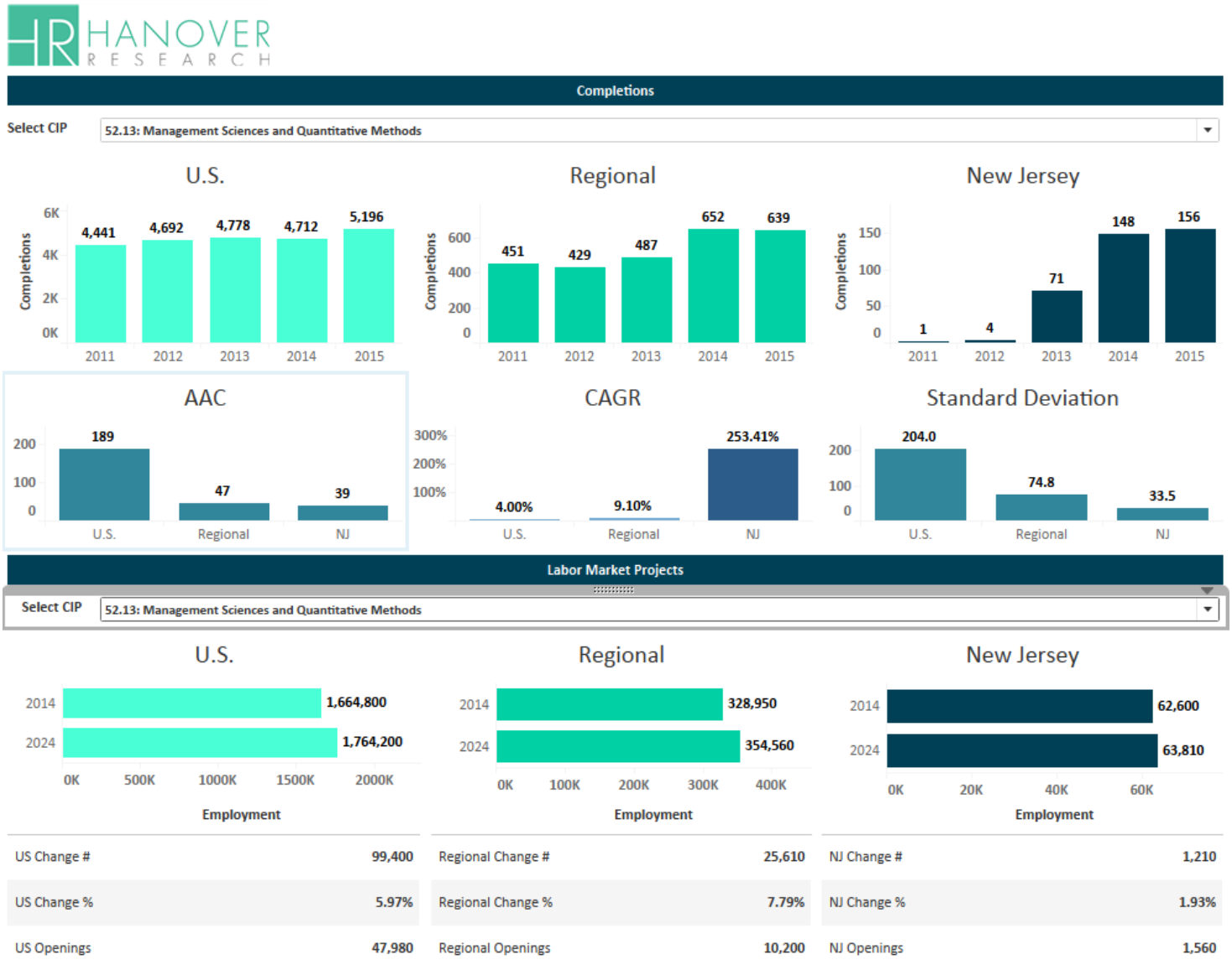
As these are fields where we are expecting Business Analytics graduates to find employment the information of interest are the bottom BLS data. All 4 fields are projected to have strong employment growth, whether nationally, regionally, or in NJ showing projected growth rates of 4% to 20%.

If you have further questions, just ask.

52.12 Management Information Systems and Services



52.13 Management Sciences and Quantitative Methods



The Committee meets every fourth Thursday of each month during fall and spring terms to consider all pre-proposals and/or proposals sent to the Chair (due by the second Thursday of each month). The Chair sends feedback by the following Thursday (one week after each meeting).

Date of Faculty Senate Committee on Academic Programs and Planning Approval:

Date of the Provosts' Council Approval:

Date of the Faculty Senate Approval:

Attach a copy of the list of courses in the "base program" courses, along with a list of courses in the new option HIGHLIGHTED to show which are in the new option. The Provost's Office will send this document, along with those attachments, to the Academic Issues Committee (AIC) of the New Jersey President's Council as an Information Item.

Base Program

B.S. BUSINESS STUDIES			MANAGEMENT CONCENTRATION
Fall 2016 – Spring 2017			
BSNS REQUIREMENTS: All BSNS program courses must be completed with a grade of "C" or better.			**80 credits**
CSIS 1206 Statistics	(4)	FINA 3562 Budgeting	(4)
ECON 1200 Macroeconomics	(4)	MGMT 3111 Human Resource Mgmt.	(4)
ECON 1400 Microeconomics	(4)	MGMT 3121 Mgmt. Info. Systems	(4)
ACCT 2110 Financial ACCT	(4)	MGMT 3123 Mgmt. Skills Development	(4)
ACCT 2120 Managerial ACCT	(4)	MGMT 3124 Organizational Behavior	(4)
BSNS 2120 Quantitative BSNS Methods	(4)	MGMT Elective	(4)
MGMT 2110 Intro to Management	(4)	MGMT 4610 Senior Seminar **OR** MGMT Elective	(4)
MKTG 2110 Marketing Principles	(4)		
PLAW 2120 Business Law I **OR** PLAW 3110 Legal, Social, Ethical …	(4)	**Internship or BSNS Elective**: Choose from ACCT, ECON, FINA, HTMS, INTL, MKTG, MGMT, PLAW at the 3000 level or above	(4)
FINA 3110 Intro to Financial Mgmt*	(4)		
MGMT 3120 Operations Management	(4)		
BSNS 4112 Business Policy & Strategies (seniors only)	(4)	Transfer students may use transferred courses (including Introduction to Business) as "Other Business Courses", to satisfy the minimum number of credits (80) for this area.	

GENERAL STUDIES REQUIREMENTS:				**48 credits**
G COURSES: (32 total credits) No more than 12 credits in any "G" category may be applied towards the BS degree				
GEN General Interdisciplinary	(4)	GNM General Natural Science & Math	(4)	
GIS-General Integration & Synthesis (Jr. yr.)	(4)	GNM General Natural Science & Math	(4)	
GAH General Arts & Humanities	(4)	GSS General Social Science	(4)	
GAH General Arts & Humanities	(4)	GSS General Social Science	(4)	
AT SOME DISTANCE Electives: (16 total credits) Courses unrelated to your major (may include CSIS courses)				
	(4)		(4)	
	(4)		(4)	
GENERAL STUDIES OUTCOME REQUIREMENTS: These course attributes should be completed within the 128 credits needed to graduate.				
(A) Arts		(V) Values/Ethics		
(H) Historical Consciousness		(I) International/Multicultural		
GENERAL STUDIES WRITING REQUIREMENT: (4 courses) Two W1 courses may be in transfer. W2 courses must be taken at Stockton.				
W1		W1/W2		W1/W2		W1/W2 at 3000 Level	
GENERAL STUDIES QUANTITATIVE REASONING REQUIREMENT: (3 courses) Two Q1 courses may be in transfer. Q2 courses must be taken at Stockton.				
Q1		Q2		Q1 or Q2		

New Program

B.S. BUSINESS STUDIES			BUSINESS ANALYTICS CONCENTRATION	
Fall 2018-Spring 2019				
BSNS REQUIREMENTS: All BSNS program courses must be completed with a grade of "C" or better.				**80 credits**
CSIS 1206 Statistics	(4)		BUSA 3XXX Intro. To Data Visualization	(4)
ECON 1200 Macroeconomics	(4)		BUSA 3XXX Introduction to Business Data Management	(4)
ECON 1400 Microeconomics	(4)		BUSA 3XXX Predictive Data Analytics	(4)
ACCT 2110 Financial ACCT	(4)		BUSA 4XXX Data Mining for Managers	(4)
ACCT 2120 Managerial ACCT	(4)		Electives: Pick 3 from:	
BSNS 2120 Quantitative BSNS Methods	(4)		BUSA 3121 Management Information Systems BUSA 3XXX Business Applications Programming in Python BUSA 3XXX Optimization in Business BUSA 3XXX Technology Ethics BUSA/MGMT 3XXX Supply Chain Management MKTG 3490 Marketing Analytics one CSIS 3000 level or above course as approved by the preceptor	(12)
MGMT 2110 Intro to Management	(4)			
MKTG 2110 Marketing Principles	(4)		Internship or Elective: Choose from ACCT, ECON, FINA, HTMS, INTL, MKTG, MGMT, PLAW at the 3000 level or above. CSIS courses as approved by preceptor can be used as electives.	(4)
PLAW 2120 Business Law I **OR** PLAW 3110 Legal, Social, Ethical …	(4)			
FINA 3110 Intro to Financial Mgmt*	(4)			
MGMT 3120 Operations Management	(4)			
BSNS 4112 Business Policy & Strategies (seniors only)	(4)		Transfer students may use transferred courses (including Introduction to Business) as "Other Business Courses", to satisfy the minimum number of credits (80) for this area.	

New content in red text

STOCKTON UNIVERSITY

School of Business
P: 609.652.4534 • F: 609.626.5539

101 Vera King Farris Drive | Galloway NJ 08205-9441
stockton.edu

March 12, 2018

Dear Ellen, Sitki, Jinchang, and Shaopeng,

Thank you for sharing your revised document of regarding the proposed new concentration in Business Analytics. I appreciate the work you did reviewing models for business analytics curricula, and in your research on similar programs in our peer and aspirant institutions. I also appreciate your willingness to work with your CSIS colleagues in order to find ways to encourage cooperation and synergy between the two programs. I appreciate that you interpret the Hanover data as I do, and agree that they shows strong demand for these with a full business orientation who have also acquired analytics skills.

As you know, but others reading this letter may not, this program is close to my professional discipline (Operations Research). I am now fully confident that you have developed a program which is well aligned with the current market for Business Analytics, in that is requires the full set of 12 business core/capstone courses and then adds the technical/managerial courses focused on Business Analytics as the concentration. As such I think it strikes a good balance between business and technical topics for business oriented analysts and will serve our graduates well in the job market both regionally and nationally. I believe this concentration is sufficiently different from the new Computer Information Systems degree (which has a more technical and requires fewer business courses) to support Stockton having both degrees. I appreciate that in this revision (and based on feedback from the first reading at Faculty Senate) you made room for CSIS courses in your elective list.

In short, this program has my full support.

Janet Wagner, Ph.D.

Janet M Wagner

Dean of Business

STOCKTON UNIVERSITY

School of Business
P: 609.652.4534 • F: 609.626.5539

101 Vera King Farris Drive | Galloway NJ 08205-9441
stockton.edu

October 12th 2017

Committee on Academic Programs and Planning,
Stockton University

Dear Colleagues,

The Business Studies Program is proposing to offer a new concentration in "Business Analytics" and the CSIS Program supports this proposal in principle. However, the proposed concentration includes redundancies with existing CSIS courses.

The CSIS faculty has closely been working in the areas of business analytics and intelligence, and offers various related courses in our curriculum. We have recently redesigned our IS concentration into a separate degree- B.S. in Computer Information Systems (CIS), which is in the final stages of state approval. We are formalizing our "Business Analytics & Intelligence", and "Cyber Security" specializations.

The Business studies proposal is different from our offering as it is targeting students with less technical background, interested in "Applied Business Analytics", primarily from a managerial perspective. We support the efforts of our colleagues in this endeavor.

It is important to note that some of their "new" courses already exist in the CSIS curriculum, and are, or could be made accessible to the business studies students, and thus avoid duplication. These courses include:

- CSIS 3222: Database Management Systems => BUSA 3XXX Intro to Business Data Management.
- CSIS 4222: Advanced Database => BUSA 3xxx Data Mining for Managers.
- CSIS 3470: Application Development => BUSA 3xxx Introduction to Business Analytics

There are also other CSIS courses which could potentially serve as electives / cognates, and we would be glad to discuss with our Business Studies colleagues about it.

It is important to note that the universities included as reference group in the proposal have various information systems (IS) related courses as "required" courses in their curriculum, as shown below:

- LaSalle- BSA410: Systems Analysis & Database Design; BSA420: Data Warehousing & Data Mining
- Manhattan- CIS 205: Intro to Prog for Bus App; CIS 310: Business Data Management.
- Montclair- INFO310: Database Management Systems; INFO367: Structured Data Analytics.
- Rutgers- 33:136:388 Foundations of Business Programming, 33:136:470- Business Data Mgmt.

Such courses from an IS perspective contribute towards enabling appropriate level of technological background and enhancing the readiness/competitiveness of business analytics majors graduating from these universities.

We understand that it is the program faculty's prerogative to develop the curriculum, and hope that our business studies colleagues would consider our input that aims towards enhancing students' learning in the classrooms, and their preparedness/ competitiveness when they enter the job market after graduation.

The CSIS Program has discussed and voted to support the Business Studies proposal of offering a new concentration in "Business Analytics" with reservation, provided the redundancies with existing CSIS courses are addressed. We are happy to work with our Business Colleagues for preparing our students for a wonderful professional career in Business Analytics.

Regards,

Aakash Taneja
CSIS Program Coordinator

School of Business

Ph: 609.652.4534
Fax: 609.626.5539

101 Vera King Farris Drive
Galloway NJ 08205
www.stockton.edu

THE RICHARD STOCKTON COLLEGE OF NEW JERSEY

Committee on Academic Programming and Planning
Stockton University

October 12, 2017

Dear Colleagues:

The CSIS program has supported our business analytics program with reservations stating that the proposed concentration has redundancies with existing CSIS courses. They are also saying that our reference universities have required information systems courses in their programs which they believe we do not have. In response to the letter from our CSIS colleagues, we would like to clarify how our courses differ from their offerings and are competitive with the offerings of other universities. We will specifically address how the three courses

1. BUSA 3XXX- Intro to Business Data Management.
2. BUSA 4XXX- Data Mining for Managers,
3. BUSA 3XXX- Introduction to Business Analytics

are different from their courses and contain similar content to our competitors.

1. BUSA 3XXX Introduction to Business Data Management- This course was adapted from Montclair's INFO 310 Database Management Systems http://catalog.montclair.edu/programs/business-administration-business-analytics-bs/. And Manhattan College's CIS 310/BUAN 310 Business Data Management http://catalog.manhattan.edu/undergraduate/business/businessanalytics/

   The pre-requisite for Montclair's course is INFO 290. Technology in Business. which is an equivalent course to our MGMT 3121/ BUSA 3121, Management Information Systems, class in the proposal. Also, many of our students enter Stockton having an introductory technology course at the freshman/sophomore level from a community college. Montclair's course does not require any programming or Math classes as pre-requisites. Manhattan College's CIS 310/BUAN 310 does not have any pre-requites.

   Montclair's INFO 310 gives students an overview of the development, applications, and management of database systems in business. Students are given a series of hands-on exercises and projects to practice skills in data analysis, database design, database queries, and applications. Manhattan College's CIS 310/BUAN 310 is centered around the core skills of identifying organizational information requirements, modeling them using conceptual data modeling techniques, converting the conceptual data models into relational data models, and implementing the models using a commercial relational database management system. It also gives students experience with SQL. We believe our course is equivalent Montclair's and Manhattan's courses as it introduces the principles and core concepts of database design as well as giving them hands-on experience using current database technologies using SQL.

Other competitor's courses such a LaSalle's BSA 410 System Analysis and Database Design require a pre-requisite equivalent to our Management Information Systems course.

The course description of CSIS 3222 Database Management Systems states that the course is a practical and conceptual introduction to the design, implementation, and management of microcomputer database systems, focusing on the relational model. Emphasis is on the concepts of data independence, integrity, normalization, and relational algebra. Students will design, implement, and document a small, normalized database.

The content of this course is much more technical than what our students need and well above the technical requirements of our competitor's courses. Furthermore, CSIS 3222 Database Management Systems has pre-requisites of CSIS 2210 Systems Design and Analysis and MATH 2225 Discrete Math. CSIS 2210 also has pre-requisites of CSIS 2101 Programming and Problem Solving I. Math 2225 has a pre-requisite of Math 1100 Pre-Calculus Math. These pre-requisites are unrealistic for our students.

2.BUSA 4XXX- Data Mining for Managers-This course has content covered from Montclair's INFO 367 Structured Data Analysis and INFO 368 Unstructured data analysis. This course is also similar to Rutger's BAIT 494, Data Mining for Business Intelligence. We specifically designed this course to give student's a project so that they could apply concepts of data mining and predictive analysis. Having a comprehensive project in a 4000 level course is consistent with how other universities structure their programs. The CSIS department does not offer a course that has students applying concepts of data mining and predictive analysis to business problems. This course specifically gives students the opportunity to apply what they have learned previous courses.

The course description of CSIS 4222 Advanced Database Systems is a continuation from CSIS 3222 of the relational data model and of database design. Additional topics embedded SQL in application code, database redesign, managing multi-user databases, managing databases with popular database management systems. Other possible topics include standards, for database application processing, sharing enterprising data, and object-oriented database processing.

This course covers SQL on a much higher level than we cover in Business Data Management and has all of the Math and Computer programming pre-requisites of CSIS 3222. It is not a realistic expectation for our students to complete all of the pre-requisites and there is no focus on solving business problems or predictive analysis.

3.BUSA 3XXX Foundations of Business Analytics- This course was adapted from Montclair University's INFO 365 Foundations of Business Analytics. Montclair's course requires no programming experience and uses spreadsheet software which is similar to our course. Montclair's pre-requisite course to this class is similar to our CSIS 1206 http://catalog.montclair.edu/programs/business-administration-business-analytics-bs/

The courses description of CSIS 3470 says the course examines file processing environment with file manipulation techniques for updating, deleting, and inserting records. Sequential, indexed and direct file structures are examined and subsequently used. Data Validation techniques are explored in relation to file updates. An appropriate language will be used to apply the concepts of the course and a major comprehensive project.

CSIS 3470 does not cover topics the process of business intelligence and business analytics, the core concepts of "big data" management, the principles of data visualization, and dashboard design. It also has the pre-requisite of CSIS 2102 which requires two programming courses. We are considering requiring management majors take this course as part of the new curriculum design. CSIS 3470 would certainly not be appropriate for management majors and would not serve as an introductory business analytics course.

In summary, our program provides students with a managerial perspective on business analytics. We do not believe there is replication with computer science. We cannot expect our students to take several pre-requisite courses to take their courses. Our program is competitive with other college and universities curriculums. It does have information science concepts taught in the Management Information Systems course. There is a free elective that allows a student to take a course from computer science. As the program grows we will have a better idea of student needs and will be more equipped to work with CSIS on developing electives.

Regards,

Ellen M. Kraft