

FORM A
Board of Regents, State of Iowa

**REQUEST TO IMPLEMENT A NEW
BACCALAUREATE, MASTERS, DOCTORAL, OR
FIRST PROFESSIONAL DEGREE PROGRAM
October 5, 2018**

THE PURPOSE OF ACADEMIC PROGRAM PLANNING: Planning a new academic degree program provides an opportunity for a Regent university to demonstrate need and demand as well as the university's ability to offer a quality program that is not unnecessarily duplicative of other similar programs offered by colleges and universities in Iowa.

Institution: Iowa State University

CIP Discipline Specialty Title: Management Sciences and Quantitative Methods, Other

CIP Discipline Specialty Number (six digits): 52.1399

Level: Bachelors

Title of Proposed Program: Business Analytics

Degree Abbreviation (e.g., B.S., B.A., M.A., Ph.D.): B.S.

Approximate date to establish degree: Month: August Year: 2019

Contact person: (name, telephone, and e-mail)

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College that will administer new program: Students majoring in Business Analytics will be Ivy College of Business students and they will get a degree in business.

Please provide the following information (use additional pages as needed). Do not use acronyms without defining them.

1. Describe the proposed new degree program, including the following:

- a. A brief description of the program. If this is currently being offered as a track, provide justification for a standalone program.

Undergraduate students wishing to focus on business analytics can currently do so by taking two elective courses in the Management Information Systems (MIS) major. These courses are MIS 436 Introduction to Business Analytics and MIS 446 Advanced Business Analytics. There is great demand for entry-level employees that have deeper and broader skills in this area, but are still business majors. The proposed major in business analytics aims to meet this demand.

The proposed major in business analytics will provide deeper and broader training for students interested in applying analytical techniques to various business applications. According to a recent McKinsey & Company report, “The biggest barriers companies face in extracting value from data and analytics are organizational; many struggle to incorporate data-driven insights into day-to-day business processes¹.” PWC states that there will be two different markets for data science and analytics jobs: analytics-enabled jobs and data science jobs.² The business analytics major is designed to produce business students for analytics-enabled jobs. This complements the data science major, which is designed to produce graduates for data science jobs. While there is overlap between the disciplines, a useful distinction is that Business Analytics is about locating and distilling useful information from structured and unstructured data to explain historical, current, and future business performance; determining the most appropriate analytical models and techniques to present and explain solutions to users. Data Science, on the other hand, is about the design, development, and deployment of algorithms through various programming techniques supporting decision tools; managing massive amounts of data and creating visualizations and other tools to aid in interpretation and understanding.³

Students majoring in business analytics will be students of the Ivy College of Business. The admission requirements to the College and to its professional program for students wishing to major in business analytics will be the same as for all other majors. The curriculum will require 31 credits of general education coursework, 22 credits of foundation coursework, 16 credits of supporting courses, 24 credits of core coursework, and 21 credits of major coursework (122 total credits). The general education, foundation, supporting, and core coursework is similar to that for other majors in the Ivy College of Business. This curriculum can be completed in eight semesters (four years).

1

<https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/McKinsey%20Analytics/Our%20Insights/The%20age%20of%20analytics%20Competing%20in%20a%20data%20driven%20world/MGI-The-Age-of-Analytics-Full-report.ashx>

² <https://www.pwc.com/us/en/library/data-science-and-analytics.html>

³ <https://www.kdnuggets.com/2015/10/infographic-data-scientist-business-analyst-difference.html>

Complete details of the curriculum can be found in Appendix B. A sample four year plan can be found in Appendix C.

b. A statement of academic objectives;

The academic objectives of the program are twofold. First, students will acquire the knowledge base and skills in business, technology, and data analysis to enter the workforce as business analytics professionals. Second, students will acquire the business-related skills that are needed to be successful on the job when they become business analytics professionals. These include the ability to: understand how a business is organized and functions, communicate effectively in written, oral, visual, and electronic modes, work in teams, make ethical choices, use quantitative and analytical methods to address unstructured business problems, think critically, understand financial statements, and understand markets and investments.

The following learning outcomes will be used for proposed business analytics major, in alignment with the learning outcomes used by all undergraduate majors in the Ivy College of Business.

1. An understanding of general business knowledge
2. Recognize ethical, legal, and global implications in business decision making
3. Work in a collaborative environment
4. Communicate effectively in written, oral, visual, and electronic formats
5. Apply critical thinking to business issues
6. Recognize the benefits and challenges of diversity
7. Use quantitative and analytical methods to address unstructured business problems

Major-specific learning outcomes include:

8. Students will be able to use current technologies related to business analytics and data management.
9. Students will be able to translate their knowledge into practice using data and business analytics.
10. Students will be able to analyze and frame business problems, as well as develop solutions using data and business analytics.
11. Students will be able to communicate solutions to problems addressed by data and business analytics, using written, oral, visual, and electronic formats.

c. What the need for the program is and how the need for the program was determined;

The need for a program came into focus after the success of the Master of Business Analytics degree program. It became apparent that some of our undergraduates had the same interest in the tools and techniques used in business analytics processes, and could

contribute positively to their employers in this regard. Many of the classes taught in the Master of Business Analytics program were initially designed at the undergraduate level, and are still being continuously updated and taught at both levels.

Currently, there is a two-course “track” in the MIS major for Business Analytics. The two courses, MIS 436 and MIS 446, currently require the database course, MIS 320, as the only pre-requisite. We are strengthening that pre-requisite to also include STAT 326 for both MIS 436 and MIS 446. The MIS major only requires STAT 226 or an equivalent course. We did an analysis of what the impact would be by making this pre-requisite change. It turns out that there are a fair number of MIS majors who either started out at DMACC or another college on campus and have done a course substitution for STAT 226. In order to meet the requirements of the Statistics department, those students would have to go back and take STAT 226 and then STAT 326 for the Business Analytics major. So they would need two more statistics courses, just to take two of the required courses for the Business Analytics major. We have communicated this to the Statistics department and they have provided a letter of support for the proposed major.

Also, by adding the STAT 326 pre-requisite to MIS 436 and MIS 446, the course instructors are going to be able to move through some of the material at a quicker rate, moving into deeper and more sophisticated applications. This change will be attractive to Finance and Accounting majors, who already are required to take STAT 326 for their majors, and we anticipate a large number of double majors from these two majors.

The new Business Analytics major will likely be a popular second major. Double and triple majors are already very common in the Ivy College, so we see this as another option for students. Also, the set of electives for the proposed major brings together a set of electives that previously would not be taken together, as they are part of five other distinct majors in the College. Our Dean’s Advisory Committee and recruiters are very excited about this particular grouping of courses, and believe it will complement the existing skill sets of students coming out of the Ivy College.

The Information Systems faculty polled recruiters to gauge employer interest in such a degree program. The results were overwhelmingly in favor of an undergraduate degree program in business analytics. As it became more apparent that such a degree program should cross functional areas, an undergraduate business analytics task force was formed with representatives from each of the departments in the Ivy College of Business.

- d. The relationship of the proposed new program to the institutional mission and how the program fits into the institution’s and college’s strategic plan;

The Ivy College of Business offers high-quality undergraduate, masters, and doctoral level programs, and has a number of nationally recognized research scholars and a strong research reputation in selected fields, including analytics. The addition of this bachelor’s level business analytics program would make a significant contribution to the College’s strategic goals. In fact, one of the items under Goal 1 of the Ivy College of Business’ 2015-2020 strategic plan calls for “the establishment of new undergraduate

majors, minors, and certificates based on industry needs.”

- e. The relationship of the proposed new program to other existing programs at the institution; describe how the proposed program will enhance other programs at the university. Will the proposed program duplicate existing programs at the university?

The foundation, supporting, and core business classes required for the business analytics major are already being taught in the Ivy College of Business. The statistics course required is currently being taught, as other Ivy College of Business majors (Accounting, Actuarial Science, and Finance) also take this course. The DS 201 Introduction to Data Science, is also already taught for students in the Data Science major. Most of the electives are also already being taught and are used as electives for the other majors in the Ivy College of Business, particularly in Accounting, Finance, Marketing, Management, Management Information Systems (MIS), and Supply Chain Management (SCM).

The Business Analytics major will complement existing majors in both the Ivy College of Business and Iowa State University. The Business Analytics major will be a useful second major to all of the current majors in the Ivy College of Business. We also believe that the Business Analytics major will complement the Data Science major, as offering students a curriculum that is much more applied than the Data Science major. Students seeking a much more theoretical degree with applications in Engineering, Science, and Medicine will pursue the Data Science major. As mentioned in 1.a., a useful distinction is that Business Analytics is about locating and distilling useful information from structured and unstructured data to explain historical, current, and future business performance; determining the most appropriate analytical models and techniques to present and explain solutions to users. Data Science, on the other hand, is about the design, development, and deployment of algorithms through various programming techniques supporting decision tools; managing massive amounts of data and creating visualizations and other tools to aid in interpretation and understanding.⁴

- f. The relationship of the proposed new program to existing programs at other colleges and universities in Iowa, including how the proposed program is different or has a different emphasis than the existing programs.

The University of Iowa offers a bachelor degree in information systems and business analytics. Students can choose to take either the information systems track or the business analytics track. Our proposed degree differs in that it is built around the functional areas of business, rather than just a different set of information systems electives. The University of Northern Iowa does not have a similar degree program. Drake University does offer a bachelor of science in business administration with a major in data analytics. While the core is similar, the set of electives is not. Also, Drake University is a private university with high tuition (currently \$19,458 per semester for students entering in the 2017-18 academic year), making it unaffordable for many students.

⁴ <https://www.kdnuggets.com/2015/10/infographic-data-scientist-business-analyst-difference.html>

- g. Special features or conditions that make the institution a desirable, unique, or appropriate place to initiate such a degree program.

Iowa State University is the perfect home for the proposed Bachelor of Science in Business Analytics. We are close to Des Moines, which has a strong technology and services sector. This creates a ready and easily accessible market for our students. The close proximity of this market makes it easy to maintain contact with the companies hiring our students and to stay up-to-date on current changes in the industry which might affect our program. As already mentioned, the program would draw on the existing strengths of the Ivy College of Business.

As indicated below, the Ivy College of Business has all of the necessary faculty and required expertise to provide an excellent program. The program fits in well with the Ivy College of Business' educational mission and with that of Iowa State University as well.

- h. Are the university's personnel, facilities, and equipment adequate to establish and maintain a high quality program?

All of the required courses for the business analytics major already exist at Iowa State University and are being taught by highly qualified faculty in the Ivy College of Business and the Departments of Computer Science. The Ivy College of Business has extensive experience in Business Analytics programs, with a Master of Business Analytics program and a graduate certificate in Business Analytics in place.

As business analytics is a growing and developing field, the set of electives is expected to also grow and evolve. Given our current track in business analytics in the MIS major, and a demand for analytics-based coursework in other majors, a full slate of electives are already available and have been taught multiple semesters. One new course in Human Talent Analytics is currently under development. This course will be an elective in multiple programs.

The Ivy College of Business is housed in the thirteen year old Gerdin Business Building. The Gerdin Business Building has state-of-the-art research and instructional technology. Other than faculty and classroom space, the main resources needed to teach the program are computer hardware and software. These resources are already available in the Gerdin Business Building.

- i. How does student demand for the proposed program justify its development?

As mentioned above, all of the courses required for the business analytics major are already offered for other programs. We have the ability to expand capacity in required courses as needed.

- 2. Describe the state and/or national workforce need and/or demand for graduates of the proposed program currently and in the foreseeable future (provide documentation about the current sources of data used to estimate need and demand).

IBM estimates that employment demand for data science and analytics jobs will reach nearly 700,000 openings by 2020. 59% of this demand will come from Finance and Insurance, Professional Services, and IT. The Des Moines market is well-represented in all of these sectors. The report also states that by 2020, jobs requiring significant expertise with data will increase by 364,000 openings to 2,720,000⁵.

The Ivy College of Business Career Services office has a strong tradition of working with undergraduate students in the various majors, and as a result report strong internship and placement rates. This is across majors, including MIS, Supply Chain Management, and Accounting, which are considered more technical and rigorous majors. We also conducted a brief employer survey and a summary of the results are provided in Appendix A.

3. List all other public and private institutions of higher education in Iowa currently operating programs similar to the proposed new degree program. (For comparison purposes, use a broad definitional framework, e.g., such identification should not be limited to programs with the same title, the same degree designation, having the same curriculum emphasis, or purporting to meet exactly the same needs as the proposed program.) If the same or similar program exists at another public or private institution of higher education in Iowa, respond to the following questions:
 - a. Could the other institution reasonably accommodate the need for the new program through expansion? Describe collaboration efforts with other institutions.

As noted in 1f above, the University of Iowa offers a bachelor degree in information systems and business analytics. Students can choose to take either the information systems track or the business analytics track. Our proposed degree differs in that it is built around the functional areas of business, rather than just a different set of information systems electives. The University of Northern Iowa does not have a similar degree program. Drake University does offer a bachelor of science in business administration with a major in data analytics. While the core is similar, the set of electives is not. Also, Drake University is a private university with high tuition (currently \$19,458 per semester for students entering in the 2017-18 academic year), making it unaffordable for many students.

As we already have a Memorandum of Agreement with the University of Iowa for the Master of Business Analytics program, we already coordinate and collaborate on course offerings at the master degree level. As all of the same departments are involved, it should not be difficult to cooperate and collaborate at the undergraduate level if needed.

- b. With what representatives of these programs has there been consultation in developing the program proposal? Provide a summary of the response of each

⁵ <https://www.forbes.com/sites/louiscolombus/2017/05/13/ibm-predicts-demand-for-data-scientists-will-soar-28-by-2020/#46d558e7e3bd>

institution consulted.

Associate Dean for Undergraduate Programs in the Tippie College of Business, Dr. Ken Brown, is the contact at Iowa. Dr. Lisa Jepsen, Associate Dean at the College of Business Administration, is the contact at Northern Iowa. Both agree that there is significant demand for students with these skills, and no one Regent's institution or private college or university will be able to meet demand.

- c. Has the possibility of an inter-institutional program or other cooperative effort been explored? What are the results of this study? (Consider not only the possibility of a formally established inter-institutional program, but also how special resources at other institutions might be used on a cooperative basis in implementing the proposed program solely at the requesting institution.)

We have not explored the possibility of an inter-institutional program. Undergraduate students generally want to attend a particular institution and as a result, we do not believe there is anything to be gained from an inter-institutional program. However, if a student in our business analytics program takes or has taken a class at either the University of Iowa or the University of Northern Iowa that is a direct substitute for one of the classes required for our program, we will allow that substitution if it meets our university and college policies for such substitutions. This arrangement is already in place for our Master of Business Analytics program, and we have accommodated a number of students this way.

- d. Do other colleges in Iowa offer programs similar to the proposed program at comparable quality and cost?

As mentioned in 1f and 2a, the University of Iowa offers an undergraduate major in Business Analytics and Information Systems. Our proposed degree program in Business Analytics is much more cross-functional than the Iowa program, as the set of electives span the functional areas of business, such as Accounting, Finance, Marketing, Human Resources, and Information Systems. There is also opportunity to take courses from the Data Science program at Iowa State University, assuming all prerequisite courses are satisfied.

- e. Are letters of support included with the program proposal?

Letters of Support from the University of Iowa and the University of Northern Iowa are included in Appendix E. We also have letters of support from the Departments of Computer Science and Statistics at Iowa State University. Copies of these letters are included in Appendix F.

4. Estimate the number of majors and non-majors students that are projected to be enrolled in the program during the first seven years of the program.
 - a. Undergraduate

Our proposal is for an undergraduate major in business analytics and all students in the major would be students in the Ivy College of Business. In many business programs, some students will not be able to handle the coursework and will transfer out of the program to other programs in the university. Most of this attrition is expected to happen between the second and third year of the program. This attrition is taken into account in our estimates. As the table below shows, the program is expected to enroll approximately 100 students once steady state has been reached.

Undergraduate	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8
Total Majors	15	30	45	65	85	100	100	100
Non-Majors	0	0	0	0	0	0	0	0

b. Graduate

Since this major is for undergraduate students, no graduate students will be allowed in the program.

Graduate	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8
Majors	0	0	0	0	0	0	0	0
Non-Majors	0	0	0	0	0	0	0	0

c. What are the anticipated sources of these students?

We will actively recruit students for the major as part of our normal recruitment process for the Ivy College of Business. Details on the business analytics major will be included in all of our marketing materials and on our website. We will recruit students from high schools throughout Iowa and the surrounding states to make sure prospective students are aware of the new major. Once prospective students are aware of the new program, we believe they will be attracted to enroll at Iowa State University. Students already at Iowa State University will also be made aware of the program. Many students change majors once they arrive at Iowa State University, primarily because they don't enjoy their initial choice of a major. For some of those students, business analytics may be a good alternative choice. We also anticipate that many current students may choose to do add business analytics as a secondary major.

5. If there are plans to offer the program away from the campus, briefly describe these plans, including potential sites and possible methods of delivery instruction. Will off-campus delivery require additional HLC accreditation?

We do not currently have any plans to offer this program away from campus.

6. Has the proposed program been reviewed and approved by the appropriate campus committees and authorities?

The proposed program has been reviewed and approved by the appropriate campus

committees. The program review and approval process is shown below. The Academic Program Approval Voting Record can also be found in Appendix F.

- a. The Undergraduate Business Analytics Task Force voted unanimously (6 in favor, 0 against) on May 9th, 2018.
 - b. The Information Systems and Business Analytics Faculty of the Department of Supply Chain & Information Systems in the Ivy College of Business voted overwhelmingly in favor of approving the proposal (18 in favor, 0 against) on August 16, 2018.
 - c. The Computer Curriculum Coordination Committee reviewed the proposal and voted unanimously in favor of approving the proposal (6 in favor, 0 against) on September 7th, 2018.
 - d. The Ivy College of Business College Curriculum Committee voted (5 in favor, 0 against) to approve this proposal on October 10th, 2018.
 - e. The Ivy College of Business Faculty voted (62 in favor, 1 against) to approve this proposal. The voting was done electronically and tallied on December 4th, 2018.
 - f. The proposal has been discussed and developed with the cooperation of the Departments of Computer Science and Statistics at Iowa State University. Their letters of support for the major are included in Appendix F.
 - g. The Faculty Senate Curriculum Committee voted in favor of approving the proposal (5 in favor, 0 against, 0 abstained) on February 11th, 2019.
 - h. The Faculty Senate Academic Affairs Council voted in favor of approving the proposal (in favor, against, abstained) on *date*.
 - i. The Faculty Senate voted in favor of approving the proposal (in favor, against, abstained) on *date*.
7. List date the program proposal was submitted to the Iowa Coordinating Council for Post High School Education (ICCPHSE) and results of listserv review. (THIS WILL BE FILLED IN BY THE PROVOST OFFICE.)
8. Will the proposed program apply for programmatic accreditation? When?

The Business Analytics major will be included as part of our business programs to be reviewed by The Association to Advance Collegiate Schools of Business (AACSB) at our next Continuous Improvement Review, which will take place during the 2019-2020 academic year. Once the major is well established, we will discuss with our industry partners and with members of our Ivy College of Business advisory councils whether the pursuit of additional accreditations would be worthwhile.

9. Will articulation agreements be developed for the proposed program? With whom?

No new articulation agreements are planned with programs at community colleges or other four year institutions. However, we will continue to honor any course level articulation agreements with community colleges that are in place at Iowa State University. In addition, if a student from a community college or other four year institution wants to transfer to Iowa State University and major in business analytics, they are welcome to do so.

10. Will there be opportunities for student internships?

There should be ample opportunities for internships. There is strong demand for MIS interns from regional employers and we believe that will be even more true for business analytics interns. We have an excellent Career Services Center in the Ivy College of Business and they will assist students in their search for internships. The progression of coursework was designed to enable students to compete for internships starting between their sophomore and junior years.

11. Describe the faculty, facilities, and equipment that will be required for the proposed program.

As mentioned in 1h, all of the courses required for the business analytics major already exist at Iowa State University and are being taught by highly qualified faculty in the Ivy College of Business. Over the past four years, the Information Systems area has added eight new tenure-track or tenured faculty with expertise in the various areas of analytics and big data. This complements the existing faculty with research and teaching expertise in the analytics domain.

The Ivy College of Business is housed in the thirteen year old Gerdin Business Building. The Gerdin Business Building has state-of-the-art research and instructional technology. Other than faculty and classroom space, the main resources needed to teach the program are computer hardware and software. These resources are already available in the Gerdin Business Building.

12. From where will the financial resources for the proposed program come (list all that apply, e.g., department reallocation, college reallocation, grants, new to the university)?

Iowa State University utilizes a decentralized financial management model for the development of its annual operating budgets. The Resource Management Model (RMM), is a responsibility-centered and incentive-driven approach to financial planning and management. The model supports departments and colleges in making budgetary decisions that enhance student success (e.g., retention), innovate by meeting market demands from students and employers for degree programs of the future, and discontinue legacy curricula which are either not aligned with industry/employer needs or for which student demand is low. Through the RMM, 25% of net tuition revenue is allocated to academic colleges based on a student's choice of major, and 75% is allocated to academic colleges based on teaching (as measured by student credit hours). Through the infrastructure of Iowa State's budget model, then, financial resources follow students and are allocated based on majors and teaching that is conducted. Tuition revenue will include both base tuition and applicable differential rates. The proposed degree program will be funded through this existing, proven financial model, and is expected to be fully self-sustaining over time. In addition to the budget model as described, financial resources may also come from internal reallocations made within the college during the program's startup phase. The level of reallocation will depend, in part, on the numbers of new students attracted to the proposed program, and the number of existing students who choose the proposed program over another program, based on standard and differential tuition rates. The proposed program

will not be dependent on grants, contracts, gifts, central university resources, or reallocations between academic colleges.

13. Estimate the total costs/total new costs (incremental increases in expenditures) that will be necessary for the next seven years as a result of the new program. Be as specific as possible.

We anticipate zero new costs to run the program over the next seven years. Printed information for all of our undergraduate majors is updated each year, so there will be no miscellaneous expenses associated with the major. We do not anticipate the need to expand recruiting, advising, or career coordinator staffing with the addition of the business analytics major.

14. Describe the marketing plan developed to communicate the new program and recruit students.

Once the program is approved, marketing materials about the program will be developed and will be shared with prospective students through our normal Ivy College of Business marketing channels. We will also work with Iowa State University marketing to promote the program and upon request, we will visit high schools in Iowa and elsewhere to discuss our program.

15. Describe the program evaluation plan to determine if the program is meeting the intended objectives, if the expected student enrollment has occurred, funding for the program, and any other components that affect the effective operation of the program.

Student recruitment and enrollment will be monitored by our Associate Dean for Undergraduate Programs to ensure enrollment objectives are being met. Assessment of learning outcomes will be monitored to ensure students are meeting the desired learning objectives and for continual improvement of the program. Student internships and student placement will be monitored to evaluate the success of the program with respect to job placement.

16. Include any additional information that justifies the development of this program.

The justification for this program has already been covered elsewhere in this proposal.

Appendix A: Comments from Employer Survey

Business Analytics Employer Survey
Spring 2017
Q2

What coursework would you like to see in an undergraduate Business Analytics major?

- Answered: 22
- Skipped: 12

Stats, Math, Finance, Biz Processes, Database Mgmt, Biz Intelligence, Data Mining

4/13/2017 12:02 PM

Statistics/Modeling of data Market Basket Analysis Project Management SAP Reporting experience HANA experience Lumira use Building out training on tool/report usage

3/30/2017 1:05 PM

1. Database knowledge, not to design, but to be able to put together simple queries. 2.

Database management. 3. SQL 4. Study around cognitive & machine learning. 5.

Communication skills, ability to communicate with clients.

3/13/2017 5:09 PM

Stats (2 courses), Data Structures (Architecture) and data visualization tools

3/13/2017 9:25 AM

A degree in business analytics would be very helpful if it had technical components with it as well. Somewhat like an MIS but focused in analytics. Coursework in R, SAS, advanced excel functions & other languages such as java or python would be most helpful to our organization. Along with critical thinking classes & real analytics project work.

How to analyze Big Data. SQL language Use of MS tools to perform this analysis within Excel or Access

3/6/2017 2:33 PM

Tableau development, Java or .Net technology

3/6/2017 9:50 AM

n/a

3/6/2017 8:21 AM

Understanding Business Reporting Needs Business Intelligence - Enterprise

Organizational Data Sources - Technology Stack Financial Analysis

3/6/2017 2:36 AM

Would want them to have some technical IT coursework

3/4/2017 12:14 PM

Querying databases Knowledge of various BI Tools Machine Learning Strong Math/Statistics

3/4/2017 9:03 AM

Understanding of software tools, real-world application of data, and basic understanding of programming and data preparation.

3/3/2017 4:01 PM

Need to ensure there are courses in data visualization (Tableau, BIdata, effective uses of excel, salesforce.com type tools) As well they need to have some basic programming

experience in R, Python, SAS or other tool. Project management methodology is also valuable (Agile, Microsoft Project)

3/3/2017 1:12 PM

Mathematics, statistics, statistical analysis, data science, data analysis, economics, information systems & analysis

3/3/2017 12:39 PM

Heavy excel work, data mining, etc.

3/3/2017 11:32 AM

How a small change in one area impacts other areas in large ways. Real world applications as well as theory.

3/3/2017 10:54 AM

SQL, Oracle, Hadoop, OBIEE

3/3/2017 10:36 AM

System Development Lifecycle, Object Oriented Programming, System Analysis, Business Process Mapping - to name a few topics

3/3/2017 10:33 AM

System processes, true analytical models- how to review and decipher data for business impact

3/3/2017 10:24 AM

Working with gathering requirements and understanding both agile and waterfall environments.

3/3/2017 10:21 AM

Statistics, Finance, Business,

3/3/2017 10:14 AM

Communication, Writing Courses

3/3/2017 10:13 AM

Business Analytics Employer Survey Spring 2017

Q3

Please share any additional comments regarding an undergraduate degree in Business Analytics:

- Answered: 17
- Skipped: 17

The skills I think are especially important are fundamental problem solving, the ability to break down a problem into manageable pieces, and the ability to get their head around complex datasets which requires an understanding of data structures well enough to make sense of data from potentially disparate sources. A bit more advanced (and rare) is the ability to translate business questions into questions about data (and the reverse process for interpreting conclusions into language that makes sense to other professionals) – components of this would be strong communication skills and solid understanding of the appropriate application and interpretation of various models. In terms of coursework, I would look for at least a year of statistics, at least 3 semesters of IT/computing to be confident/comfortable with various software platforms, architectures, data structures, etc., and additional semesters focused on data

summarization/modeling in various areas of business analytics – ranging from operational, customer, HR and Finance – perhaps a general overview course of applications in industry followed by an opportunity for students to specialize in their realm of greatest interest. Accompanying coursework in the fields where they would likely apply their analytics work would be a strengthening feature – such as course work in Finance, Management, Supply Chain/Logistics, Mfg Operations, etc. A senior seminar where students learn how to consult on real (or at least realistic) problems would be ideal.

3/30/2017 1:05 PM

At minimum a course in Analytics should be required for all MIS majors

3/13/2017 9:25 AM

Tools - R, Python, Apache, SAS, Tableau, Excel

3/7/2017 5:22 PM

This talent is important for our growth at Sogeti. The college grads need to have some technology experience in Java or .Net. They can also have more specialized experience with data tools like Tableau or others. We find that just hiring someone as an analyst with some data experience is hard to find entry level opportunities. So the more technical experience they have, the better.

3/6/2017 9:50 AM

Overall, likely a very good idea ... however, our needs would probably be minimal

3/6/2017 8:21 AM

This is a great idea as the need for data transparency and integration increases.

3/3/2017 4:01 PM

There is significant growing demand for this talent and current supply does not meet needs. Students with an undergrad in business analytics will be highly sought after as organizations and data insights and the ability to communicate findings are critical.

3/3/2017 1:12 PM

I tend to think "business analytics" is generally descriptive of a set of skills you can bring to bear on most problems businesses are trying to solve. However, most jobs are a bit more aligned to a certain function than that (i.e. accounting, investments, IT, customer service, HR, communications). In any of these functions you can use business analytics to be more effective, but I think companies will continue to hire for students with majors which align best to the function and hope to develop skill sets which make them more productive like business analytics. I do think companies would be very interested in seeing more HR/Communication/Management/IT majors who have a Business Analytics certification, because those are the types of skill sets we are looking for in the professionals who are working in these functions.

3/3/2017 12:51 PM

This is a need that is growing and hiring numbers will be increasing dramatically in this area across many industries within the next 2-3 years.

3/3/2017 12:39 PM

This is an area that we have identified as a large gap in our members. A major in this would be hugely appealing to employers. Thank you for the consideration!

3/3/2017 12:07 PM

This will be a well rounded area with both business knowledge and logic/analytical knowledge to process real world data to generate information to help a company make wise choices.

3/3/2017 10:54 AM

Make sure they have strong database skills.

3/3/2017 10:36 AM

A degree in Business Analytics would give graduates a strong position for Business Analyst roles at our company

3/3/2017 10:33 AM

Being a trendy profession right now there are many definitions of Business Analytics as well as anything with "data" in it. Helping students and businesses get to a common definition and clear understanding will be beneficial.

3/3/2017 10:24 AM

I would like to see these individuals have more traditional skills outside of technology. So they have the ability to relate and communicate with others in various fields. They maybe able to find and pull the data from technical aspects, but need to talk with the people as well to uncover additional facts.

3/3/2017 10:13 AM

Our consulting practice is much more IT based. We struggle to find opportunities for students who don't have a technical background. We love to see dual majors(accounting and analytics or finance and analytics) for accounting and business consulting roles but have very few roles that are for analytics majors specifically.

3/3/2017 10:12 AM

Need critical thinking. Need skills to interpret and act on data, not just massage the numbers.

3/3/2017 10:09 AM

Appendix B: Business Analytics Program Requirements

Course/Subject Area	Credits
General Education Requirements	
International Perspective (May count towards global perspective)	3*
U.S. Diversity (May count towards humanities/social science)	3*
Communications	
ENGL 150 - Critical Thinking and Communication	3
ENGL 250 – Written, Oral, Visual, and Electronic Communication	3
ENGL 302 – Business Communication	3
SP CM 212 – Fundamentals of Public Speaking	3
LIB 160 – Information Literacy	1
Humanities/Social Science	9
Natural Science	3
Global Perspectives	6
<i>Total General Education Requirements</i>	<i>31*</i>
Pre-Professional/Foundation Requirements	
BUSAD 102/103 - Orientation	1
COM S 113 – Introduction to Spreadsheets and Databases	3
MATH 150 – Discrete Math for Business & Social Sciences	3
ECON 101 – Principles of Microeconomics	3
ECON 102 – Principles of Macroeconomics	3
BUSAD 250 – Introduction to Business	3
STAT 226 – Introduction to Business Statistics	3
ACCT 284 – Financial Accounting	3
<i>Total Pre-Professional/Foundation Requirements</i>	<i>22</i>
Supporting Requirements	
BUSAD 203 – Business Careers and Employment Preparation	1
PHIL 230 – Moral Theory and Practice	3
ACCT 215 – Legal Environment of Business	3
MATH 151 – Calculus for Business and Social Sciences	3
STAT 326 – Introduction to Business Statistics II	3
<i>Total Supporting Requirements</i>	<i>3</i>
	<i>16</i>
Business Core Requirements	
ACCT 285 – Managerial Accounting	3
MIS 301 – Management Information Systems	3
FIN 301 – Principles of Finance	3
MGMT 371 – Organizational Behavior	3
MGMT 372 – Responsible Management and Leadership in Business	3
MKT 340 – Principles of Marketing	3
SCM 301 – Supply Chain Management	3
MGMT 478 – Strategic Management	3
<i>Total Business Core Requirements</i>	<i>24</i>

Major Requirements	
DS 201 – Introduction to Data Science	3
MIS 320 – Database Management Systems OR ACCT 384 – Accounting Information Systems and Analytics	3
MIS 436 – Introduction to Business Analytics	3
MIS 446 – Advanced Business Analytics	3
Choose 3 courses (9 credits) from approved list	9
<i>Total Major Requirements</i>	<i>21</i>
Total Program Requirements**	122

*The international perspective and U.S. diversity courses can be dual assigned to count towards global perspectives and humanities/social sciences credits, respectively. If this occurs, total general education requirements are 31 credits.

**Students will need to take enough “free” electives to fulfill the minimum graduation requirement of 122 credits.

Appendix C – Sample Four Year Plan

FRESHMAN	
Fall	Spring
BUSAD 102/103 (1 cr.)	ECON 102 (3 cr.)
ECON 101 (3 cr.)	STAT 226 (3 cr.)
COM S 113 (3 cr.)	BUSAD 250 (3 cr.)
ENGL 150 (3 cr.)	GLOBAL/INT'L (3 cr.)
MATH 150 (3 cr.)	ACCT 284 (3 cr.)
LIB 160 (1 cr.)	
14 cr.	15 cr.

SOPHOMORE	
Fall	Spring
ACCT 285 (3 cr.)	SP CM 212 (3 cr.)
BUSAD 203 (1 cr.)	STAT 326 (3 cr.)
HUM/SOC SCIENCE (3 cr.)	PHIL 320 (3 cr.)
MATH 151 (3 cr.)	MIS 301 (3 cr.)
ENGL 250 (3 cr.)	NATURAL SCIENCE (3 cr.)
DS 201 (3 cr.)	
ACCT 301 (1 cr.) if taking ACCT 384	
16/17 cr.	15 cr.

JUNIOR	
Fall	Spring
ACCT 215 (3 cr.)	MIS 436 (3 cr.)
MIS 320 (3 cr.) OR ACCT 384 (3 cr.)	BUSINESS CORE (3 cr.)
BUSINESS CORE (3 cr.)	BUSINESS CORE (3 cr.)
BUSINESS CORE (3 cr.)	GLOBAL PERSPECTIVES (3 cr.)
US DIVERSITY/HUM/SOC SCIENCE (3 cr.)	ENGL 302 (3 cr.)
ELECTIVE (1 OR 2 cr.)	
16/17 cr.	15 cr.

SENIOR	
Fall	Spring
MIS 446 (3 cr.)	BUSINESS ANALYTICS ELECTIVE (3 cr.)
BUSINESS ANALYTICS ELECTIVE (3 cr.)	MGMT 478 (3 cr.)
BUSINESS ANALYTICS ELECTIVE (3 cr.)	ELECTIVE (3 cr.)
HUM/SOC SCIENCE (3 cr.)	ELECTIVE (3 cr.)
BUSINESS CORE (3 cr.)	ELECTIVE (3 cr.)
15 cr.	15 cr.

122 credits required as a minimum

Appendix D: Currently Available Business Analytics Elective Courses

Electives (Minimum of 9 credits)	Course Number	Course Name	Credits	Pre-requisites
	ACCT 484	Advanced Accounting Information Systems	3	ACCT 384
	FIN 450	Analytical Finance	3	STAT 326 and ECON 301 or FIN 301
	MGMT 473x ⁶	Advanced Human Resource Management I	3	MGMT 371
	MIS/ACCT 315	Business Data Streams and Issues	3	Com S 113
	MKT/MIS 368	Marketing Analytics	3	MKT 340
	MKT 361x	Social Media Marketing Strategy	3	MKT 340
	MKT 367x	Consultative Problem Solving	3	Sophomore or Higher Standing
	MKT 445	Customer Relationship Management	3	MKT 340
	SCM 430x ⁷	Supply Chain Analytics	3	SCM 301
	SCM 460	Decision Tools for Logistics & OM	3	SCM 301

⁶ Initial offering in Spring 2019.

⁷ Initial offering in Spring 2019.

Appendix E: Letters of Support from the Departments of Computer Science and Statistics at Iowa State University

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

College of Liberal Arts and Sciences
Department of Computer Science
226 Atanasoff Hall
tel: 515 294 4377
fax: 515 294 0258
url: www.cs.iastate.edu

November 30, 2018

To: Jackie Rees Ulmer, Ph.D.
Associate Dean for Undergraduate Programs
Union Pacific Professor of Information Systems
Ivy College of Business
Iowa State University

Dear Dr. Ulmer,

With this letter I want to express my support for the proposals for a Major and a Minor in Business Analytics being put forward by the Ivy College of Business at Iowa State University.

The field of data science is exploding, and all indications are that the US industry will require an increasing number of data scientists with expertise ranging from the more theoretical algorithms and statistical knowledge to the more applied business, forecasting, and inference applications.

Iowa State University has recently created a Major, a Minor, and a Certificate in Data Science, administered by the College of Liberal Arts and Sciences, with a substantial core of computer science and statistics courses complemented by a range of application courses from other departments and colleges at Iowa State.

The Major and Minor being proposed by the Ivy College of Business at Iowa State University are substantially different from those in Data Science, because they are targeted exclusively to business students, thus they will be focused on, and motivated by, business applications. For this reason, I expect that potential competition for students choosing between Business Analytics and Data Science will be minimal; rather, students will have additional opportunities.

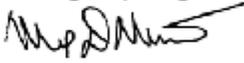
In conclusion, I believe that the new Business Analytics degrees will be a valuable complement to the current Data Science degrees, and that the State of Iowa will be better off by offering both.

Best regards,



Gianfranco Ciardo
Professor and Chair
Department of Computer Science
Iowa State University of Science and Technology
ciardo@iastate.edu

Interoffice Communication

DATE: October 24, 2018
TO: Jackie Rees Ulmer, Associate Dean for Undergraduate Programs, College of Business
FROM: Max D. Morris, Professor and Chair of Statistics 
SUBJECT: Proposed undergraduate major and minor in Business Analytics

This memo is to formally offer Department of Statistics support for the proposed CoB undergraduate major and minor programs in Business Analytics. As you note in your proposal, this should nicely complement the new LAS Data Science program, and so increase the variety of program options available to ISU students in this area.

The Statistics Department is delighted to support this effort.

Appendix F: Letters of Support from the University of Iowa and the University of Northern Iowa



Undergraduate Program Office

0140 John Pappajohn Business Building
Iowa City, Iowa 52242-1994
319 335 1057 Fax 319 335 3092
www.tippie.uiowa.edu/tipo

November 18, 2018

Board of Regents, State of Iowa
11260 Aurora Ave
Urbandale, IA 50322

Dear Members of Board of Regents,

I am writing to endorse the Iowa State University Ivy College of Business proposal to add a business analytics major. Here in the Tippie College of Business we already redesigned our Management Information Systems major to include a track in business analytics and a track in information systems. Since this change, we have had double-digit growth in these majors year-over-year for 3 years. We have also added a master's program in business analytics here on campus to complement our office-campus master's program in business analytics offered off-campus. Frankly, we are running as fast we can to keep up with demand.

Given the strength and growth of our programs, we do not believe that the introduction of a major at Iowa State will negatively influence our campus or our programs. In fact, I personally believe that adding a program in business analytics is in the best interests of the state as this type of high demand program should not be limited to one campus.

If you have questions, please do not hesitate to contact me directly via email (kenneth-g-brown@uiowa.edu) or phone (1-319-335-0924).

Sincerely,

Kenneth G. Brown, Ph.D.
Associate Dean, Undergraduate Program
Ralph L. Sheets Professor of Management

TIPPIE HENRY B. TIPPIE
COLLEGE OF BUSINESS

November 26, 2018

Dean David Spalding
Raisbeck Endowed Dean
Ivy College of Business
Iowa State University

Dear David,

Thank you for reaching out to us regarding your proposed undergraduate major in Business Analytics within the Ivy College of Business. We believe that this growing field will attract many students at all three Regent institutions, and we support the new program.

Sincerely,



Leslie K. Wilson
College of Business Administration
University of Northern Iowa

Appendix G: Academic Program Approval Voting Record

This document is to be appended as the last page of the proposal for any new or revised academic program to record the successive votes of approval as the proposal moves through its required review and approval steps. Consult Faculty Handbook Section 10.8 or the Faculty Senate Curriculum Committee website for information regarding Committee review and voting requirements for each action.

Curricular Action: (check appropriate boxes below)

1. New Program Name Change Discontinuation Concurrent Degree for:
2. Undergraduate Major Graduate Major Undergraduate Minor Graduate Minor
 Undergraduate Certificate Graduate Certificate Other: _____
3. Name of Proposed Change: Business Analytics (B.S. Degree)_____
4. Name of Contact Person: Dr. Jacquelyn Rees Ulmer e-mail address: jrulmer@iastate.edu
5. Primary College: Ivy College of Business____ Secondary College: _____
6. Involved Department(s): Primarily the Department of Supply Chain and Information Systems within the Ivy College of Business.

Voting record for this curricular action:

Voting Body	Votes			Date of Vote
	For	Against	Abstain	
Ivy College of Business, Undergraduate Business Analytics Task Force	6	0	0	May 9 th , 2018
Information Systems Faculty	18	0	0	August 16 th , 2018
Computer Curriculum Coordination Committee	6	0	0	September 7 th , 2018
Ivy College of Business Curriculum Committee	5	0	0	October 10 th , 2018
Ivy College of Business Faculty Approval Vote	62	1	0	December 4 th , 2018
Graduate Council				
Faculty Senate Curriculum Committee	5	0	0	February 11 th , 2019
Faculty Senate Academic Affairs Council	8	0	0	February 20, 2019
Faculty Senate				