



**MEMORANDUM**

**To:** Julio Frenk  
University President

**From:** Linda L. Neider  
Chair, Faculty Senate

A handwritten signature in blue ink, appearing to read 'L. Neider', is written over the name 'Linda L. Neider' in the 'From:' field.

**Date:** February 21, 2020

**Subject:** Faculty Senate Legislation #2019-54(B) – Creation of a Minor in Business Analytics for Bachelor of Business Administration (BBA) and Bachelor of Science in Accounting and Finance (BSAF) Students – Miami Herbert Business School

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The Faculty Senate, at its February 19, 2020 meeting, had no objections to the approval of the Miami Herbert Business School's creation of a new minor in Business Analytic for BBA and BSAF students.

The proposal is enclosed for your reference.


This legislation is now forwarded to you for your action.

LLN/ss/rh

cc: Jeffrey Duerk, Executive Vice President and Provost  
John Quelch, Dean, Miami Herbert Business School  
Jigar Patel, Assistant Professor of Professional Practice – Management Science, Miami Herbert Business School

**CAPSULE:** Faculty Senate Legislation #2019-54(B) – Creation of a Minor in Business Analytics for Bachelor of Business Administration (BBA) and Bachelor of Science in Accounting and Finance (BSAF) Students – Miami Herbert Business School

**PRESIDENT’S RESPONSE**

APPROVED:  DATE: 3/10/20  
(President’s Signature)

OFFICE OR INDIVIDUAL TO IMPLEMENT: John Quelch, Dean, Business School

EFFECTIVE DATE OF LEGISLATION: IMMEDIATELY  
(if other than June 1 next following)

NOT APPROVED AND REFERRED TO: \_\_\_\_\_

REMARKS (IF NOT APPROVED): \_\_\_\_\_

# Program Change Request

## New Program Proposal

Date Submitted: 01/21/20 9:49 am

Viewing: : **Minor in Business Analytics (for BBA and BSAF students)**

Last edit: 01/21/20 9:49 am

Changes proposed by: Patty Murphy (pxm491)

### In Workflow

1. PG Assessment and Accreditation
2. PG MAS Chair
3. PG FS Office for UCC
4. PG University Curriculum Committee
5. PG FS Office for GWC
6. PG FS GWC
7. PG Faculty Senate
8. PG FS Office for President
9. PG Registrar

### Approval Path

1. 01/21/20 1:16 pm  
Patty Murphy (pxm491): Approved for PG Assessment and Accreditation
2. 01/21/20 7:26 pm  
Yongtao Guan (yguan): Approved for PG MAS Chair
3. 01/28/20 1:40 pm  
Robyn Hardeman (rhardeman): Approved for PG FS Office for UCC
4. 01/29/20 4:24 pm  
David Chin (dchin1): Approved for PG University

Please list the authors of this proposal including name, rank/title, program/department, and school.

**Proposer(s) Name**

Jigar Patel, Ph.D.

Assistant Professor of Professional Practice

Management Science

Miami Herbert Business School

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**EXECUTIVE SUMMARY**

Nowadays, the literacy of the foundations of Business Analytics has become a requirement for any business professional. Every big organization prefers to derive the maximum value from their investments and resources and seeks professionals who can speak the language of analytics. These organizations represent a wide spectrum including consulting companies, financial corporations, technology corporations and many others. There are many studies that indicate the dearth of Analytics literate business professionals in the current market. In response to this new market trend, the MAS department proposes to offer a minor in Business Analytics to the BBA and BSAF students.

**Eligibility:** A BBA or BSAF student can declare Business Analytics as their minor only if they have achieved at least a minimum 3.6 average for MTH161, MAS 201 and MAS 202.

Career Undergraduate

**Academic Structure**

**School/ College**

**Department**

Miami Herbert Business School

Management Science

Plan Type Minor

Who can take this program? Any Students in this College/School

**Proposed Plan Code**

Plan Name Minor in Business Analytics (for BBA and BSAF students)

Effective Term Fall 2020

First Term Valid      Fall 2020

Program Instruction Mode      In Person

Where is the program offered?      **Location**      **Please provide the % of instruction at each location.**

Coral Gables Campus      100

Total Credits      12

Areas of Knowledge

STEM

## To Be Published in the Academic Bulletin

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### Program Overview

#### Minor Area of Specialization in Business Analytics for BBA and BSAF Students (STEM)

Miami Business School BBA and BSAF students who choose the minor area of specialization in Business Analytics are trained to combine quantitative, statistical, and computational tools and techniques to help companies understand, predict, and act on large amounts of data, improving decision-making in increasingly complex and interconnected business environments.

### Curriculum Requirements

## Curriculum Requirements

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The 12-credit-hour minor in Business Analytics for BBA and BSAF students consists of the following:

#### Course List

Code	Title	Credit Hours
<b>Required Courses 1</b>		
<a href="#">MAS 332</a>	Data Acquisition, Preparation and Visualization 2	3
<a href="#">MAS 342</a>	Introduction to Optimization and Decision Making 2	3
<a href="#">MAS 432</a>	Data Analysis 3	3
<b>Choice Courses for the Minor</b>		
Select one course (3 credit hours) from the following:		3
<a href="#">BTE 320</a>	Introduction to Programming	
<a href="#">BTE 423</a>	Database Management Systems	
<a href="#">MAS 548</a>	Data Mining and Knowledge Acquisition	
<a href="#">MAS 549</a>	Big Data Analytics	
<b>Total Credit Hours</b>		<b>12</b>

1 All courses must be taken within the current pre-requisite structure. In order to declare this minor, students will need to have earned a minimum 3.6 average for MTH 161, MAS 201, and MAS 202.

2 offered in fall semester

3 offered in spring semester

\***Note:** All specific coursework for the minor in Business Analytics must be completed with a grade of "C-" or better. In addition, a minimum cumulative GPA of 2.5 is required for all specific coursework taken in the minor area of specialization.

No course may double count in any other major, minor, or cognate.

## Rationale

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Rationale

Market Demand

Relationship to Other Programs

Library Resources Available and Needed to Support the Program

Laboratory Facilities, Equipment, and Space Available and Needed to Support the Program

Other Resources Available or Needed to Support the Program

## Curriculum

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## Program Curriculum

### **RATIONALE**

In the current business environment, the professionals are required to be trained in the foundations of business analytics. Every big organization prefers to derive the maximum value from their investments and resources and seeks professionals who can speak the language of analytics. These organizations represent a wide spectrum including consulting companies, financial corporations, technology corporations and our partners including CITI, FPL, UHealth, Quantros, VITAS, Publix's Risk Management Division, and Norwegian Cruise Lines, to name a few. There are many studies that indicate the dearth of business professionals in the current market who are trained in analytics. In a recent article published in the US News, Business Analytics was ranked 7th among 11 hot college majors that led to

jobs (<http://www.usnews.com/education/best-colleges/articles/2013/09/10/discover-11-hot-college-majors-that-lead-to-jobs?page=2>).

The proposed minor in Business Analytics is aimed to train our students to develop skills necessary to gather, understand, manipulate, and make use of data in a business context. This set of skills touches on the four main phases of analytics:

Database Management: consolidation and preparation of data for analysis,

Descriptive Analytics: understanding of data, what business inferences can be made from available data,

Predictive Analytics: use of data to make predictions,

Prescriptive Analytics: use of data insights and the forecasts to determine the best courses of action to achieve business goals.

The Management Science Department consists of faculty with diverse expertise such as analytics, statistics and machine learning, optimization, simulation, and quality management. There are faculty members within the department who are actively doing teaching and research related to each one of the four phases of analytics. As a result, the department is in a unique position to offer a valuable Business Analytics minor to our students.

More specifically, Business Analytics minor courses will give a solid foundation to our students to excel in any business environment.

The MAS 332-- Data Acquisition, Preparation and Visualization course will provide our students adequate background related to database management. The students will be able to consolidate and prepare data for further analyses

The MAS 432-- Data Analysis course will expose our students to more advanced statistical modeling techniques that are critical for predictive modeling

The MAS 342-- Introduction to Optimization and Decision Making, and MAS 442-- Decision Making under Uncertainty, courses will provide solid trainings to our students on more effective decision making. These courses are related to the prescriptive phase of analytics.

Our additional electives from both within and outside the department will further strengthen our students' skills needed for the different phases of analytics. We anticipate that on completion of the minor, our students will emerge well versed in analytics foundations. They will be sought after in the job market and also ready to take on more advanced studies at the graduate level.

See attached Peer Comparisons.

Upload Syllabi for Any New Courses

## CIP Code

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Proposed CIP Code 52.1302 - Business Statistics.

## Faculty

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Program Directors

N/A

Upload CV(s)

Program Faculty

N/A

## Documents

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Attach Supporting Documentation

Reviewer

Comments

**Patty Murphy (pxm491) (01/21/20 1:13 pm):** The Department of Management Science faculty voted in favor of this proposal on 11/6/2019. The Undergraduate Business Education Committee (UBEC) voted unanimously in favor of this proposal and the MHBS School Council approved this proposal on 11/15/2019.

**Patty Murphy (pxm491) (01/21/20 1:15 pm):** This new program does not represent a significant departure from currently approved programs because it is simply a repackaging of existing courses and we currently offer a minor in business analytics for students in the BSBA program. Therefore, notification to or approval from SACSCOC is not required.

**Robyn Hardeman (rhardeman) (01/28/20 1:39 pm):** Forwarded to UCC recommendation.

**David Chin (dchin1) (01/29/20 4:24 pm):** On 1/29/20 the University Curriculum Committee voted to support this proposal as submitted.

Key: 526



## Rationale and Justification

In the current business environment, the professionals are *required* to be trained in the foundations of business analytics. Every big organization prefers to derive the maximum value from their investments and resources and seeks professionals who can speak the language of analytics. These organizations represent a wide spectrum including consulting companies, financial corporations, technology corporations and our partners including CITI, FPL, UHealth, Quantros, VITAS, Publix's Risk Management Division, and Norwegian Cruise Lines, to name a few. There are many studies that indicate the dearth of business professionals in the current market who are trained in analytics. In a recent article published in the US News, Business Analytics was ranked 7<sup>th</sup> among 11 hot college majors that led to jobs (<http://www.usnews.com/education/best-colleges/articles/2013/09/10/discover-11-hot-college-majors-that-lead-to-jobs?page=2>).

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- Database Management: consolidation and preparation of data for analysis,
- Descriptive Analytics: understanding of data, what business inferences can be made from available data,
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- The MAS 342-- Introduction to Optimization and Decision Making, and MAS 442-- Decision Making under Uncertainty, courses will provide solid trainings to our students on more effective decision making. These courses are related to the prescriptive phase of analytics.

Our additional electives from both within and outside the department will further strengthen our students' skills needed for the different phases of analytics. We anticipate that on completion of the minor, our students will emerge well versed in analytics foundations. They will be sought after in the job market and also ready to take on more advanced studies at the graduate level.

### **Minor in Business Analytics for BBA and BSAF:**

**Eligibility:** A BBA or BSAF student can declare Business Analytics as their minor only if they have achieved at least *a minimum 3.6 average* for MTH161, MAS 201 and MAS 202.

### **Required Courses (9 credits)**

- MAS 332: Data Acquisition, Preparation and Visualization
- MAS 342: Introduction to Optimization and Decision Making
- MAS 432: Data Analysis

**Elective Course (3 credits)** Choose one of the following four:

- BTE 320: Introduction to Programming
- BTE 423: Database Management Systems
- MAS 548: Data Mining and Knowledge Acquisition
- MAS 549: Big Data Analytics

## Comparison to Programs in Peer Institutions

Before designing our curriculums, we had gathered information from several other similar programs in this area that had excellent reputations, namely: Wharton, Rutgers University, University of Iowa, University of Arizona, Indiana University, Ohio State University and University of Rochester. The table below lists further information about these programs.

University, School	Name of degree	Website
Upenn, Wharton School of Business <b>(Exhibit A)</b>	Business Analytics Track	<a href="https://mba-inside.wharton.upenn.edu/buan-major/">https://mba-inside.wharton.upenn.edu/buan-major/</a>
Rutgers, School of Business <b>(Exhibit B)</b>	Business Analytics and Information Technology	<a href="https://www.business.rutgers.edu/undergraduate-new-brunswick/business-analytics-concentration">https://www.business.rutgers.edu/undergraduate-new-brunswick/business-analytics-concentration</a>
University of Iowa, School of Business	Business Analytics and Information Systems	<a href="http://admissions.uiowa.edu/academics/business-analytics-and-information-systems">http://admissions.uiowa.edu/academics/business-analytics-and-information-systems</a>
University of Arizona, School of Business	Business Data Analytics	<a href="http://wpcarey.asu.edu/undergraduate-degrees/data-analytics">http://wpcarey.asu.edu/undergraduate-degrees/data-analytics</a>
Indiana University, Kelly School of Business	Business Analytics	<a href="https://kelley.iu.edu/faculty-research/departments/business-economics-public-policy/undergraduate/business-analytics/index.cshtml">https://kelley.iu.edu/faculty-research/departments/business-economics-public-policy/undergraduate/business-analytics/index.cshtml</a>
Ohio State University <b>(Interdisciplinary)</b>	Business Analytics Specialization under Data Analytics	<a href="https://data-analytics.osu.edu/major/specialization/business-analytics">https://data-analytics.osu.edu/major/specialization/business-analytics</a>
University of Rochester, Institute for Data Science	Data Science	<a href="http://www.rochester.edu/data-science/degrees/BSdetails.html">http://www.rochester.edu/data-science/degrees/BSdetails.html</a>

When it comes to content, we made sure to include the main core topics that appeared in almost every program surveyed (two sample curriculums are included on the next two pages). These topics span over the four main phases of Analytics, namely, *data base* management, consolidation and preparation for analysis, *descriptive* (understanding of data, what business inferences can be made from available data), *predictive* (use of data to forecast), and *prescriptive* (use of understanding of data and the forecasts to determine the best courses of action to achieve business goals). Given the strengths of the Management Science Department in both Statistics and Operations Research, we are able to provide in-house strong trainings in these two areas, which is an important point of differentiation from the other programs.

## Exhibit A

### Curriculum for the Business Analytics Track at Operations and Information Management Department, Wharton

Required	Phases of Analytics
OPIM 101 An Introduction to Operations and Information Management	Prescriptive
<b>Four electives within the department</b>	
OPIM 105 Developing Tools for Data Access and Analysis	Database management, consolidation and preparation for analysis; Descriptive
OPIM 290 Decision Processes	Prescriptive
OPIM 311 Business Computer Languages	All phases related
OPIM 315 Data Base Management Systems	Database management
OPIM 316 Systems Analysis, Design, and Implementation	Prescriptive
OPIM 319 Seminar in Decision Systems	Prescriptive
OPIM 321 Management Science	Prescriptive
OPIM 325 Computer Simulation Models	Prescriptive
OPIM 353 Mathematical Modeling and its Application in Finance	Predictive
OPIM 399 Independent Study on Business Analytics	All phases related
OPIM 410 Data Mining for Business Intelligence	Descriptive; Predictive
<b>Two electives from outside the department</b>	
ESE 303 Stochastic Systems Analysis and Simulation	Predictive; Prescriptive
ESE 304 Optimization Techniques	Prescriptive
ESE 501 Multicriteria Decision Making	Prescriptive
MKTG 271 Models and Tools for Marketing Tactics and Strategy	Predictive; Prescriptive
MKTG/STAT 476 Applied Probability Models in Marketing	Predictive
MUSA 504 Business Geographics	Descriptive; Predictive
STAT 430 Probability	Predictive; Prescriptive
STAT 432 Mathematical Statistics	Predictive
STAT 434 Financial and Economic Time Series	Predictive

## Exhibit B

### Curriculum for Business Analytics and Information Technology at Rutgers University

<b>Required</b>	<b>Phases of Analytics</b>
Business Data Management	Database management
Business Decision Analytics under Uncertainty	Prescriptive
Foundations of Business Programming	Foundation for all phases
Time Series Modeling for Business	Predictive
<b>Electives (choose 3)</b>	
Data Mining for Business Intelligence	Descriptive; Predictive
Enterprise Information Architecture	Database management
Information System Security	Database management
Large-Scale Business Data Analysis	Predictive
Optimization Modeling	Prescriptive
Risk Modeling	Predictive
<b>Two electives from a list of 18 courses covering Computer Science, Statistics, Operations Research, and others</b>	All phases covered



November 22, 2019

Faculty Senate  
University of Miami  
Coral Gables, FL

Dear Faculty Senate:

I write to extend my enthusiastic support of offering the Minor in Business Analytics to our BBA and BSAF students. The proposal was well supported by the Management Science faculty, and unanimously by the Undergraduate Business Education Committee. It was read in School Council and was approved by that body on November 15, 2019.

The proposed minor will undoubtedly enrich our BSAF, and BBA students' skills in business analytics and augment their future career prospects.

Thank you for your support and collaboration. I look forward to working with the Faculty Senate on other matters in the future.

Sincerely,




John Quelch

Dean  
Miami Herbert Business School

cc: Yongtao Guan, Chair of Management Science Department  
Chester Schriesheim, Speaker of School Council  
Ann Olazabal, Vice Dean for Undergraduate Business Education

# Memorandum

**Date:** December 5, 2019  
**To:** Faculty Senate  
**CC:** Vice Dean Ann Olazábal  
**From:** Robert Plant   
**Subject:** Business Analytics Minor to BBA and BSAF students

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On Behalf of the Department of Business Technology, I write to you in support of the proposed curriculum modification to the BBA and BSAF, specifically with regard to the soft requirements that BSAF and BBA students take **one elective class out of proposed four classes:**

- BTE 320: Introduction to Programming
- BTE 423: Database Management Systems
- MAS 548: Data Mining and Knowledge Acquisition
- MAS 549: Big Data Analytics

The relevant BTE classes are regularly scheduled during the academic year, and we anticipate no issues with staffing related to these courses.

## **MEMORANDUM**

**TO:** Faculty Senate

**FROM:** Mrs. Blanca Ripoll  
Secretary of the Faculty School Council  
Miami Business School

**DATE:** February 3, 2020

**SUBJECT:** Unanimous approval of the Proposal for Offering a Minor in Business Analytics to BBA and BSAF Students

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On Friday, November 14, 2019, the School Council of the Miami Herbert Business School (MHBS) unanimously approved the proposal for offering a Minor in Business Analytics to BBA and BSAF students.

cc: Dr. Y. Guan, Chair, Management Science Department.