

GRADUATE COUNCIL
NEW COURSE/PROGRAM PROPOSAL

ORIGINATING UNIT: *Neeley*

TYPE OF ACTION:

_____ New course
_____X_____ New program
_____ Fully Online Course/Program**

Semester and year course/program will take effect: *Summer2020*

NEW COURSE or PROGRAM TITLE: *Master of Science in Business Analytics*

Appropriate computer abbreviation (30 spaces or less): MS Business Analytics

New course number: n/a

Proposed CIP Code (programs only): 52 52.1399 Management Science and Quantitative Methods, Other

*for reference please visit: <https://nces.ed.gov/ipeds/cipcode/resources.aspx?y=56>

Prerequisites for new course: n/a

DESCRIPTION OF NEW COURSE OR PROGRAM (catalog copy):

One-year MS degree in Business Analytics focused on four broad learning outcomes:
Mastering the art of understanding complex business and managerial issues, and applying an analytics lens to address them; converting the analytical modeling results into optimal courses of action and managerial strategy; effectively facilitating communication between technical and non-technical audiences; embracing a sense of responsibility and commitment to ethical decision-making, particularly in ambiguous and unstructured contexts.

Fully Online Courses/Programs**

All online programs, courses, and /or distance learning offerings must meet State Compliance regulations as defined by specific state legislation. TCU Distance Learning is any for-credit instruction provided to a TCU student outside the State of Texas. This includes internships, clinical, video conferencing, online, or any other delivery format that crosses state lines. Contact the Koehler Center for Teaching Excellence for guidelines. Include a letter of support from the Koehler Center with this proposal.

SUPPORTING EVIDENCE OR JUSTIFICATION (For a new course, attach proposed syllabus, including course objectives, course outline, and representative bibliography. For a new program attach a statement of the mission and objectives of the new program):

Please see attached for full program proposal; Neeley approved 30-hour curriculum below

Proposed Required Courses MS in Business Analytics (13.5 credit hours):

Course#	Course Name	CH	Semester
Prereq	Excel Certification		Summer
Prereq	Foundation for statistics		Summer
	(Online course+4 hr workshop)		
ACCT 60970	Accounting Fundamentals	1.5	Summer
MARK 60011	Marketing Fundamentals	1.0	Summer
FINA 60011	Finance Fundamentals	1.0	Summer
INSC 60011	Supply Chain Fundamentals	1.0	Summer
BUSI 60070	Simulation	1.5	Summer
INSC 60050	Business Analytics	1.5	Summer
INSC 60010	Statistical models	1.5	Fall
INSC 60070	Data Visualization	1.5	Fall
BUSI 70970	Capstone Project	3.0	Spring

Proposed Electives MS in Business Analytics (Select 16.5 CH from 21 offered)

Course#	Course Name	CH	Semester
ACCT 70970	Accounting Analytics	1.5	Fall
ACCT 70970	Business Processes and Risk	1.5	Fall
BUSI 70200	Business Intelligence and Analytics	1.5	Fall
FINA 70523	Financial Modeling	3.0	Fall
INSC 71100	ERP Simulation	1.5	Fall
MARK 70770	Marketing Research	1.5	Fall
INSC 71110	Predictive Analytics with SAP	1.5	Winter Int
INSC 71130	Data Analytics Simulation	1.5	Winter Int
MARK 70110	Marketing Analytics	1.5	Spring
MARK 70210	Analytics for Innovation	1.5	Spring
MARK 70200	Customer Relationship Marketing	1.5	Spring
MARK 70390	Digital Marketing Analytics	1.5	Spring
MANA 70970	People Analytics	1.5	Spring

Describe the intended outcomes of the course or program and how they will be assessed.

Assessment Plan embedded in Program description and copied below

	Program Goals	What should student be able to do after completing the program?	How do you plan to prove this? (Think about what courses and/or assignments that can be provided as proof)	benchmark: minimum acceptable for student performance target: portion of students who you would like to meet that benchmark?	How often do you plan to measure this?
1	Critical Thinking and Analysis	Master the ability to understand complex business and managerial issues, and apply an analytics lens to address them.	BUSI 70970 Capstone Course - Final Project	80% meeting or exceeding expectations	Once every 2 years
2	Strategic Decision Making	Convert the analytical modeling results into optimal courses of action and managerial strategy.	BUSI 70970 Capstone Course - Final Project	80% meeting or exceeding expectations	Once every 2 years
3	Communication Skills	Effectively facilitate communication between technical and non-technical audiences.	BUSI 70970 Capstone Course - Final Project	80% meeting or exceeding expectations	Once every 2 years
4	Ethical Decision Making	Embrace a sense of responsibility and commitment to ethical decision-making, particularly in ambiguous and unstructured contexts.	BUSI 70970 Capstone Course - Final Project	80% meeting or exceeding expectations	Once every 2 years

ADDITIONAL RESOURCES REQUIRED:

Faculty: One additional full-time faculty position (PPP or visiting) plus incremental adjunct funding for additional coverage in this or other Neeley programs. Visiting position approved for 20-21.

Space: Classroom space assigned

Equipment: None

Library: None

Financial Aid: None

Other: None

CHANGE IN TEACHING LOAD:

Does this change affect any other units of the University? ____ Yes __X__ No

If yes, submit supporting statement signed by chair of affected unit.

If cross-listed, provide evidence of approval by all curriculum committees appropriate to both the originating and the cross-listed units.

Chair of Originating Unit:

Signature: _____

Name: _____ David Allen _____

Unit: _____ Neeley _____

Revised 12/2019

Proposal for MS in Business Analytics

“When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge of it is of a meager and unsatisfactory kind.”

*- Lord William Kelvin
(1824 - 1907)*

In the interests of not letting ‘perfect be the enemy of good.....’

*- attributed to Voltaire
(1694 - 1778)*

Contents:

- I. Background
- II. Objectives & Outcomes
- III. Proposed Required Courses
- IV. Proposed Electives
- V. Assessment
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- VII. Course Descriptions for Courses

I. Background:

Organizations today are wrestling with data of unprecedented volume and complexity, often with little idea regarding how precisely to use it in order to better inform their decisions. The McKinsey Global Institute, in fact, reports that the biggest hurdle facing companies is in trying to integrate data and analytics into their existing operations; they see recruiting and retaining analytical talent as their most challenging role yet. (Reference: The Age of Analytics: Competing in a Data-Driven World, December 2016). As sheer technical ability monopolizes one end of the talent spectrum and pure management monopolizes the other, there is a vast and growing demand for talent that can understand and speak to both. This, along with the special circumstances our graduating students are facing today, offers TCU and Neeley a very unique opportunity to serve our students, businesses and other stake holders as well.

With this in mind, we propose a 1-year program (half the length of our full time MBA) offering a graduate degree in a more focused space as described above – namely, a Master of Science degree in Business Analytics. In considering the competitive academic space, there are, broadly

speaking, two formats used by schools to offer the MS degree in Business Analytics. One is from the pure Data Science perspective with a majority of the courses coming from the computer science or engineering fields, and an emphasis on specific programming and coding languages. The other is a more middle of the road approach with emphasis on the use of analytics and the application of current packaged methodologies. It was pointed out that companies also look for a middle approach – they need to have employees that can serve as ‘translators’ between the managers and the pure data science language. In line with this thinking, Alteryx (a tool for data analytics) serves just this purpose, and is currently in use by at least 2 faculty. Thus, given the profile of our students, as well as the experience of our committee, **the committee unanimously agrees that the more middle of the road, applied approach would be the better path for us.**

II. Objectives & Outcomes:

Objectives:

1. To offer a Master of Science degree in a fast growing and highly desirable area in the job market - Business Analytics.
2. To offer our TCU students facing a forced gap year, a means of acquiring a degree and skills that add value to their portfolio.
3. To leverage our faculty strengths and match them with sought after skills in the industry.
4. To supplement resources for Neeley in order to keep pace in an increasingly competitive marketplace as Neeley grows and we seek ways to enhance our presence in academia and in the business world.

Outcomes:

On completion of the MS in Business Analytics program, students should be able to:

1. Master the art of understanding complex business and managerial issues, and apply an analytics lens to address them.
2. Convert the analytical modeling results into optimal courses of action and managerial strategy.
3. Effectively facilitate communication between technical and non-technical audiences.
4. Embrace a sense of responsibility and commitment to ethical decision-making, particularly in ambiguous and unstructured contexts.

III. Proposed Required Courses for an MS in Business Analytics (13.5 credit hours):

Course#	Course Name	CH	Semester
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Note1: The Fundamentals courses over the summer will be delivered in a separate cohort with a focus on analytics.

Note2: The Pre requisites would be waived for Neeley undergraduates.

Note3: An immediate need in the core is for a course on Ethics and Data Privacy. The development for this course will be in place for '21- '22. As of now, these issues are addressed the foundation analytics course, INSC 60050 (Business Analytics), taken at the start of the program in the summer.

IV. Proposed Electives for an MS in Business Analytics (Select 16.5 CH from 21 offered)

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Note1: These courses will be offered separately and specifically for this cohort.

Note2: Selection of courses from this set should be done individually in conjunction with advisors and with individual career paths in mind. We are expecting these students to have access to the Neeley MBA advising team – we in fact believe this to be vital.

Note3: As departments build up suitable courses, they may be added to the list of electives giving students a wider choice set to make a selection from. Two specific areas needing coverage are the AI/machine learning, and ethics and privacy.

V. Assessment

Please refer to the following table for assessment of learning:

	Program Goals	What should student be able to do after completing the program?	How do you plan to prove this? (Think about what courses and/or assignments that can be provided as proof)	benchmark: minimum acceptable for student performance target: portion of students who you would like to meet that benchmark?	How often do you plan to measure this?
1	Critical Thinking and Analysis	Master the ability to understand complex business and managerial issues, and apply an analytics lens to address them.	BUSI 70970 Capstone Course - Final Project	80% meeting or exceeding expectations	Once every 2 years
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VI. Student Support Services

1. Recruiting and Admissions

- Led by Graduate Recruiting and Admissions Director, supported by contractor and redeployment of Neeley alumni role.
- Marketing efforts supported by Marketing faculty expertise and Neeley communications team.

MS Business Analytics Admission Requirements

3.0 Undergraduate GPA plus evidence of quantitative aptitude.

Submission requirements:

Official undergraduate and graduate transcripts

Personal Statement (500 words) answering the following questions:

- Why do you want to pursue the TCU MS in Business Analytics Program? Briefly describe your short-term and long-term career goals.
- What do you feel makes you a strong candidate for this program?

Contact information for two academic/professional references (at least one faculty reference required)

Professional resume

SAT/ACT scores or GMAT/GRE scores

Eligible candidates will be invited to a 30 minute interview

2. Academics

- David Preston, Professor of Information Systems and Supply Chain Management, to serve as Faculty Leader/Advisor.
- Olivia Williams, Graduate Director of Academic Programs, to provide general communications and enrollment support.
- Would mirror roles/rhythm of existing MS-SCM program with regard to academic support.

3. Student Life

- Led by Linda LaCoste integrating her request for increased student engagement responsibilities.
- Linda would coordinate with Peggy Conway regarding broader student life integration.

4. Career support

- Led by Jessica Cates and team
- Hybrid of existing MAc model and PMBA coaching model

5. Alumni Engagement

- Led by Peggy Conway, extension of alumni engagement role
- Will be included in graduate-wide alumni engagement initiatives (Gala, Homecoming, etc.)

VII. Course descriptions for current and proposed electives

ACCT 60970 Accounting Fundamentals

A study of the fundamental concepts of financial accounting and reporting by business entities in accordance with generally accepted accounting principles. The course approaches the material from the perspective of the financial statement user rather than the financial statement preparer. Therefore, emphasis is placed on the use and interpretation of information contained in business financial statements by managers, investors, and creditors.

ACCT 70970 Accounting Analytics

This course allows students to explore how accounting information contributes to business analytics and how analytical methods can be used to investigate past financial performance, forecast future financial performance, and deliver insights for decision making. Students will gain an understanding of how financial data and non-financial data interact by applying analytical techniques to realistic data in a series of cases to arrive at business decisions.

ACCT 70970 Business Processes and Risk

This course addresses the emerging roles of accounting analytics in business and auditing settings. Students will learn data a variety of analytical skills to identify and assess business and audit risks within key transaction processing cycles fundamental to companies across industries. Students will also learn to understand data within the context of accounting information systems to generate effective responses to mitigate risks exposures.

BUSI 60070 Business Simulation

This course helps students integrate concepts from the different business disciplines by involving them in a complex computer simulation of realistic business situations. Teams of students are required to make business decisions involving a diverse set of business functions and activities over a series of rounds in which conditions change. Through successive phases of the simulation, students must respond to the actions of competing company teams represented by their classmates and are exposed to the consequences of their previous decisions. The course, which is taught at the end of the required core courses, requires students to draw on the material from those courses in making their decisions. Student performance in the simulation is reflected in a balance scorecard of multiple metrics. At the end of the simulation, students present their rationales for their decisions.

BUSI 70200 Business Intelligence and Analytics

This course will cover the analysis of data as it pertains to accounting professionals. The focuses include analytic techniques for decision making and the examination of “big data” involving accounting information. Ideally, the course will utilize SAP, Power BI/Tableau/Lumira, IDEA, and SQL to allow students to continue building upon the skillsets developed in the Analytics core classes. Integrating common tools and applications across disciplines will provide the student a richer experience and broader perspective. Potential topics include Sources of Accounting Data; Financial Reporting & Analysis: slicing & dicing, queries & reports; Data Visualization: Charts, Dashboards & Advanced Visualization Techniques; Audit Analytics; Data Mining & Fraud; Descriptive Models for Accounting Decision Making...

BUSI 70970 Capstone Project

This course gives students the opportunity to integrate, apply, and expand the concepts and tools learned throughout the MS in Business Analytics curriculum. The project is operated as an independent study with focus on a specific problem or research opportunity that can be addressed with analytics. Students must complete this course to earn their MS in Business Analytics.

FINA 60011 Finance Fundamentals

The course is designed to help bridge the gap between an undergraduate experience in Finance and a graduate level course. As such, there is less emphasis on memorization of terminology and much greater emphasis on critical thinking, analytics, and decision-making. This course will review some of the basic concepts, but a major emphasis will be placed on identifying and describing practical applications of key concepts by means of case studies and projects, with emphasis on the ambiguities and nuances occurring in applying theory to empirical projects. This

is also supplemented by developing students' critical thinking skills through in-depth analysis of financial decisions from a managerial perspective. This course will help students better understand the key issues that managers face when they make investment decisions, including technical issues, such as knowledge of cash flows, time-value of money, valuation principles, but also big picture issues, examining what the sources of value creation are, how to deal with managerial biases and estimation uncertainty, and how investment decisions must fit with the strategic vision of the firm.

FINA 70523 Financial Modeling

The emphasis of the course is on developing skills for financial modeling. After completion of this course, students will acquire the tools needed to build financial models, and design the analysis to create insights from the models.

INSC 60011 Supply Chain Fundamentals

The course is designed to bridge the gap between an undergraduate knowledge of operations and/or supply chain management and a graduate level course. As such, there is less emphasis on memorization of terminology and much greater emphasis on critical thinking, analytics, and decision-making. The course demonstrates how various processes and partnerships within a company's supply chain can be integrated to deliver value to customers. Students who do well in this course will learn to speak the language of supply chain management and they will understand fundamental supply chain strategies and tactics that can be used to gain competitive advantage.

INSC 60050 Business Analytics

This course is an introduction to the fundamentals of business analytics. Business analytics are enabled by business intelligence (BI) tools for the purpose of analytic decision making. BI systems combine gathering data, storing it, and analyzing it to present complicated company and competitive information to planners and decision makers. By providing wider visibility to plans and supporting data, analytical tools increase the return on existing organizational planning applications because they help companies understand where and how they deviate from their plan objectives. In addition, they provide shared data availability that encourages a global perspective on business performance. Real-world case studies will show students the ways organizations are using analytics to support both tactical and strategic decision-making.

INSC 60010 Statistical models

This course teaches quantitative methods used in data analysis and business decision-making with an orientation towards regression analysis. This course presents the basic topics in regression including statistical inference from regression output, limitations of regression models and the pitfalls involved in their use. Analysis of both cross-sectional data and time-series data will be discussed. Additional topics include aspects of statistical process control, ANOVA, chi-square tests and logistic regression. The course is taught from an applied perspective using computer software (Excel and Minitab) to perform statistical analyses.

INSC 60070 Data Visualization

Designed for students who have an interest in developing data visualization skills. Big Data is everywhere, but a big data set can be difficult to understand and interpret. Presenting data to your audience in the right aesthetic form and functionality is critical to convey the information effectively. This hands-on course will focus on how to use various data analysis tools and techniques to communicate complex information with visually appealing charts, graphs and maps. The course will focus on: 1) employing best practices for using databases to create visualizations and maps that tell stories with data, 2) learning how to prepare data visualizations, 3) creating interactive data illustrations including dashboards, and 4) building business analytic skills using Tableau.

INSC 71100 ERP Simulation

The ERP Simulation is an innovative learning by doing and problem based approach to teaching MBA students ERP concepts. During the game, students will work on teams to run a business with a real-life SAP ERP system. The simulation places the students at the heart of a make to stock manufacturing company, where they must operate the full business cycle (plan, procure, produce and sell), and in so doing experience the value of up and downstream information visibility.

INSC 71110 Predictive Analytics with SAP

Predictive analytics is the practice of extracting information from existing data sets with data visualization software in order to determine patterns and predict future outcomes and trends. The course will employ a learning-by-doing approach to teach students how to utilize the latest SAP analytics applications to analyze real-world Big Data sets to anticipate future behavior. In particular, students will practice the three major areas that comprise predictive analytics (i.e., reporting, visualization, and prediction) through guided exercises and case studies.

INSC 71130 Data Analytics Simulation

This course in Data Analytics course utilizes Analytics simulations to explore concepts of process design and strategic decision-making. This course takes an analytical approach to allow MBA students to increase their intuition and understanding of core operational and performance concepts. The focus of this course is to: a) expose students to the core concepts in data and process analysis in a dynamic and experiential manner; b) increase student intuition regarding the interplay between the various elements of data analytics via toolkit-style exercises; c) give students the tools by which to understand data analysis via experimentation and proactive creation. These principles are examined via hands-on exercises, case studies, and class discussion.

MANA 70970 People Analytics

The concept of “people analytics” (also referred to as “HR analytics,” “workforce analytics,” and similar) refers to a data-driven approach for managing employees that overcomes limitations associated with more subjective methodologies (e.g., making decisions based on personal relationships, prior experiences, and/or cognitive biases). This course will introduce

philosophical issues (e.g., inductive and deductive logic, ethics, etc.) associated with using data to manage employees; discuss popular and up-and-coming problems that may benefit from analytic approaches; build knowledge of the fundamental issues associated with identifying and measuring critical variables; and, provide hands on experience collecting, analyzing, and interpreting people-related data. Students should exit the course with a solid conceptual foundation of people analytics as well as demonstrable skills that can be used to improve outcomes for employees and organizations. I will strive throughout the class to facilitate meaningful discussions and encourage deep critical thinking that emphasize the complexity, outright messiness, and opportunity associated with using analytics to guide workforce management. I will also rely on practitioner- and scholarly-oriented articles, case studies, guest speakers, and experiential assignments to achieve our learning objectives.

MARK 70770 Marketing Research

Marketing research is about providing relevant, accurate and timely information for marketing decisions. This includes information about competition, external environment and current as well as potential customers. Whether or not you ever work in a marketing research function, at some point in your business career, you most likely will need to deal with marketing research, either as a producer or as a user. The course is designed to provide an overview of marketing research and its use in making more effective marketing decisions. The primary emphases are designing research studies that are both valid and pertinent, and accurately interpreting analysis to guide managerial decisions.

MARK 70110 Marketing Analytics

Tools for positioning products (Perceptual maps, Joint space maps, factor analysis), segmenting markets (cluster analysis), classifying customers into segments based on observables (discriminant analysis), along with higher-level methods useful for a variety of marketing tasks, including higher level regression and response models for resource allocation decisions, etc. Focus on methods and intuition behind methods. Use of small cases and projects to illustrate use of methods. More in depth analytics.

MARK 70210 Analytics for Innovation

Applications surrounding innovation (Conjoint analysis, diffusion, outcome-driven innovation research) and other key marketing issues (pricing and customer lifetime value). Focus on practical applications, including combining tools with segmentation techniques. Use of small cases and projects to illustrate use of methods.

MARK 70200 Customer Relationship Marketing

This course focuses on the measurement and management of customer selection, customer acquisition, and customer value. Key concepts explored in the course include: (1) identifying and selecting customers, (2) understanding management of customer acquisition, (3) estimating the value of a customer, (4) linking customer value to shareholder value, and (5) understanding which marketing actions are most appropriate for growing the value of a customer segment.

MARK 70390 Digital Marketing Analytics

Digital marketing has become an essential component of any firm's marketing strategy, and even though more and more dollars are being shifted to digital, marketers and executives are still trying to grasp this medium that is continually evolving. In this course, with a focus on digital marketing analytical tools, students will develop an understanding of digital marketing, study the most important digital channels, gain an understanding of the most challenging topics in digital marketing today including programmatic, attribution, measurement and privacy as well as develop some hands-on experience managing digital marketing campaigns.