Naveen Jindal School of Management

Master of Science in Business Analytics

36 semester credit hours minimum

Faculty


**Associate Professors:** Mehmet Ayvaci, Nina Baranchuk, Norris Bruce, Zhonglan Dai, Rebecca Files, Michael Hasler, Dorothee Honhon, Bin Hu, Kyle Hyndman, Surya N. Janakiraman, Robert L. Kieschnick Jr., Atanu Lahiri, Jun Li, Ningzhong Li, Maria Loumioti, Lívia Markóczy, Amit Mehra, Toyah Miller, Ramachandran (Ram) Natarajan, Naim Bugra Ozel, H. Dennis Park, Anyan Qi, Cuili Qian, Young U. Ryu, Gil Sadka, Harpreet Singh, David J. Springate, Upender Subramanian, Shaojie Tang, Kelsey D. Wei, Han (Victor) Xia, Yexiao Xu, Alejandro Zentner, Jiaying Zhang, Yuan Zhang, Feng Zhao, Yibin Zhou

**Assistant Professors:** Khai Chiong, Emily Choi, Rafael Copat, Soraya Fatehi, Andrew Frazelle, Ying Huang, Joonhwi Joo, Sora Jun, Jason Kautz, Tongil Kim, Sheen Levine, Meng Li, Christopher Mace, Samir Mamadehussene, Jean-Marie Meier, Radha Mookerjee, Jedson Pinto, Ignacio Rios Uribe, Alejandro Rivera Mesias, Alessio Saretto, Simon Siegenthaler, Serdar Simsek, Kirthi Sinha, Xiaoxiao Tang, Shervin Tehrani, Ashwin Venkataaraman, Christian Von-Drathen, Guihua Wang, Hongchang Wang, Pingle Wang, Shouqiang Wang, Junfeng Wu, Steven Xiao, Yingjie Zhang, Zhe (James) Zhang

**Professor Emeritus:** John J. Wiorkowski

**Associate Professors Emeriti:** J. Richard Harrison, Jane Falk

**Clinical Professors:** John Barden, Britt Berrett, Abhijit Biswas, Pamela Foster Brady, Shawn Carraher, Larry Chasteen, Paul Convery, David Cordell, Howard Dover, John Gamino, Randall S. Guttery, William Hefley, Robert Hicks, Marilyn Kaplan, Sonia Leach, Peter Lewin, Jeffrey Manzi, John F. McCracken, Diane S. McNulty, Divakar Rajamani, Daniel Rajaratnam, Kannan Ramanathan, David Ritchey, Mark Thouin, McClain Watson, Jeff Weekley, Habte Woldu, Fang Wu, Laurie L. Ziegler

**Clinical Associate Professors:** Shawn Alborz, Dawn Owens, Carolyn Reichert, Avanti P. Sethi, Ramesh Subramoniam, James Szt, Aysegul Toptal, David Widdifield

**Clinical Assistant Professors:** Athena Alimirzaei, Christina (Krysta) Betanzos, Moran Blueshtein, Judd Bradbury, Sourav Chatterjee, Jerome Gafford, Ayfer Gurun, Jeffery (Jeff) Hicks, Revansiddha Khanapur, Kristen Lawson, Kathryn Lookadoo, Liping Ma, Sarah Moore, Ravi Narayan, Parneet Pahwa, Jason Parker,
Degree Requirements

The Master of Science in Business Analytics (MS BUAN) is a 36 semester credit hours STEM (Science, Technology, Engineering and Mathematics) degree program that provides students with a broad foundation in the business analytics and data science area. The program prepares students for professions in data science, big data, and analytics space. The core courses are designed to provide the foundation of tools and techniques to be used in the analytics domain whereas the electives allow for business application of the core techniques in Accounting, Finance, Cybersecurity, Healthcare, IT, Marketing, Social Media, and Operations. The program provides three options:

(1) The Flex Program allows students the flexibility to complete the program at their own pace and tailor their degree in preparation for specific career goals by selecting electives from various fields, including Accounting, Cybersecurity, Data Engineering, Data Science, Finance, Healthcare, IT, Marketing, Social Media, and Operations. The purpose of the program is to equip students with the technical tools and professional communication skills needed to practice in business analytics. Multiple elective tracks are offered in the Flex Program. Admission to the program occurs in Fall, Spring, and Summer semesters.

(2) The Cohort Program is a two-year program in which students take all courses together as a cohort. It is designed for students from various backgrounds to gain knowledge to pursue opportunities in business analytics. The purpose of the program is to develop effective leaders in business analytics. Students may complete the Accounting Analytics track or the Data Science track. The Accounting Analytics track is offered in a face-to-face Cohort Program on campus, while the Data Science track may be completed in either a face-to-face Cohort Program on campus or an Online Cohort program. Special tuition, fees, and admissions requirements apply and the program is supported entirely by participant tuition/fees. Admission to the program occurs in Fall, Spring, and Summer semesters.

(3) The Online Program allows students the flexibility to complete the program completely online at their own pace, and tailor their degree in preparation for specific career goals by selecting electives from the Data Science track. The purpose of the program is to equip students with the technical tools
and professional communication skills needed to practice in business analytics. Admission to the program occurs in Fall, Spring, and Summer semesters.

To apply for this degree program, an undergraduate degree is required (all majors are considered). Students must maintain a 3.0 grade-point average (GPA) in both core courses and in all graduate courses taken in the degree program, excluding program prerequisites to qualify for the MS degree. Following the completion of 18 credit hours, a student must successfully complete an internship or practicum.

Prerequisites

Students pursuing the Master of Science in Business Analytics degree program are required to fulfill one semester credit hour of \textit{MAS 6102} Professional Development course. In addition, knowledge of calculus is required and students who have not completed an undergraduate calculus course may satisfy the prerequisite by completing \textit{OPRE 6303} Quantitative Foundations of Business. Degree credit is not earned for program prerequisites, however, the grade achieved in prerequisites will count toward the student's grade-point average (GPA). All program prerequisites must be satisfied within the first semester of graduate study as a degree-seeking student.

Course Requirements

Core Courses: 18 semester credit hours

- \textbf{BUAN 6312} Applied Econometrics and Time Series Analysis
- \textbf{BUAN 6320} Database Foundations for Business Analytics
- \textbf{BUAN 6324} Business Analytics With SAS
  - or \textbf{BUAN 6356} Business Analytics With R
- \textbf{BUAN 6337} Predictive Analytics Using SAS
- \textbf{BUAN 6398} Prescriptive Analytics
- \textbf{BUAN 6359} Advanced Statistics for Data Science

Elective Courses: 18 semester credit hours

Students may choose any course with a BUAN prefix, excluding BUAN core courses, or any course from one or more tracks in the following areas to obtain in-depth knowledge in a specific industry domain. Students may also substitute up to six semester credit hours master’s-level courses from any unrestricted course/prefix offered within JSOM.

- \textbf{BUAN 6009} Business Analytics Internship (Required Elective)\(^1\)

Accounting Analytics Track

- \textbf{ACCT 6301} Financial Accounting
  - or \textbf{ACCT 6330} Intermediate Financial Accounting I

\(^1\)
ACCT 6336  Information Technology Audit and Risk Management
ACCT 6343  Accounting Information Systems
ACCT 6344  Financial Statement Analysis
  or ACCT 6332  Intermediate Financial Accounting II
ACCT 6384  Analytical Reviews Using Audit Software
  or ACCT 6334  Auditing
ACCT 6386  Governance, Risk Management and Compliance (GRC)

Cybersecurity Analytics Track
MIS 6316  Data Communications
MIS 6330  Cybersecurity Fundamentals
MIS 6333  Digital Forensics and Incident Management
MIS 6337  Information Technology Audit and Risk Management
MIS 6343  Advanced Cybersecurity Management
MIS 6348  Digital Governance, Risk, and Compliance
MIS 6384  Preparing for Cybersecurity Threats

Data Engineering Track
BUAN 6340  Programming for Data Science
BUAN 6345  SAP Analytics
BUAN 6346  Big Data
BUAN 6347  Advanced Big Data Analytics
BUAN 6358  AWS Cloud Analytics
BUAN 6385  Robotic Process Automation
MIS 6309  Business Data Warehousing
MIS 6363  Cloud Computing Fundamentals
MIS 6383  Advanced Data Management
MIS 6389  AWS Cloud Solution Architecture

Data Science Track
BUAN 6335  Organizing for Business Analytics Platforms
BUAN 6340  Programming for Data Science
BUAN 6341  Applied Machine Learning
BUAN 6342  Applied Natural Language Processing
Notes on Business Analytics:

- BUAN 6346 Big Data
- BUAN 6357 Advanced Business Analytics With R
- BUAN 6382 Applied Deep Learning
- BUAN 6385 Robotic Process Automation
- MIS 6380 Data Visualization

**Decisions and Operations Analytics Track**

- BUAN 6385 Robotic Process Automation
- MIS 6398 Blockchain Technology and Applications
- OPRE 6302 Operations Management
- OPRE 6304 Operations Analytics
- OPRE 6332 Spreadsheet Modeling and Analytics
- OPRE 6335 Risk and Decision Analysis
- OPRE 6377 Demand and Revenue Analytics
- OPRE 6378 Supply Chain Strategy

**Financial Analytics Track**

- ACCT 6301 Financial Accounting
- FIN 6301 Financial Management
- FIN 6307 Mathematical Methods for Finance
- FIN 6352 Financial Modeling For Valuation
- FIN 6353 Financial Modeling for Investment Analysis
- FIN 6360 Derivatives Markets
- FIN 6368 Financial Information and Analysis
- FIN 6382 Numerical and Statistical Methods in Finance
- FIN 6392 Financial Technology and Blockchain
- MIS 6398 Blockchain Technology and Applications

**Healthcare Analytics Track**

- HMGT 6320 The American Healthcare System
- HMGT 6323 Healthcare Informatics
- HMGT 6325 Healthcare Operations Management
- HMGT 6327 Electronic Health Records Applications
- HMGT 6334 Healthcare Analytics
**Marketing Analytics Track**

- **BUAN 6335** Organizing for Business Analytics Platforms
- **MKT 6301** Marketing Management
- **MKT 6309** Marketing Data Analysis and Research
- **MKT 6336** Pricing Analytics
- **MKT 6341** Marketing Automation and Campaign Management
- **MKT 6342** Marketing Customer Insights Development
- **MKT 6343** Social Media Marketing and Insights
- **MKT 6345** Quantitative Marketing Decision-Making
- **MKT 6347** Marketing Analytics Project
- **MKT 6349** MarTech Ecosystem
- **MKT 6352** Marketing Web Analytics and Insights
- **MKT 6353** Customer Analytics and Insights
- **MKT 6384** Advanced Marketing Web Analytics and Insights

**Social Media Analytics Track**

- **BUAN 6335** Organizing for Business Analytics Platforms
- **BUAN 6340** Programming for Data Science
- **BUAN 6341** Applied Machine Learning
- **BUAN 6344** Web Analytics
- **BUAN 6392** Causal Analytics and A/B Testing
- **MIS 6334** Advanced Business Analytics with SAS
- **MIS 6373** Social Media Business
- **MIS 6378** Customer Relationship Management with Salesforce
- **MIS 6380** Data Visualization

**Enterprise Systems Analytics Track**

- **BUAN 6345** SAP Analytics
- **BUAN 6386** SAP Cloud Analytics
- **MIS 6319** Enterprise Resource Planning with SAP
- **MIS 6309** Business Data Warehousing
- **MIS 6332** ERP Configurations and Implementation with SAP
- **MIS 6369** Supply Chain Software with SAP
Graduate Certificate in Applied Machine Learning

12 semester credit hours

Faculty

Overview

The Graduate Certificate in Applied Machine Learning comprises courses that teach statistics geared towards data science needs, and important concepts in business analytics, machine learning and natural language processing necessary for business applications.

Students pursuing this certificate will be exposed to:

1. Statistical methods to analyze data from observational studies and experimental designs, and to communicate relevant findings to a business audience.
2. Approaches that extract actionable intelligence from firms' business data for various applications, including (but not limited to) customer segmentation, customer relationship management (CRM), personalization, online recommendation systems, web mining, and product assortment.
3. Machine learning approaches focused on applications to business data, like approaches for text mining, non-linear regression models, resampling methods, neural networks, etc.
4. Natural language processing and related approaches that help gain actionable insights in real-world applications (for example, through the analysis and interpretation of language in the contexts of social media and business text/unstructured data).

Required courses: 12 semester credit hours

- **BUAN 6341** Applied Machine Learning
- **BUAN 6342** Applied Natural Language Processing
- **BUAN 6356** Business Analytics with R
- **BUAN 6359** Advanced Statistics for Data Science

1. Students may use BUAN 6009 only for their first internship and any additional internship must be completed as BUAN 6V98 (3 semester credit hours maximum). Students may use BUAN 6V98 or BUAN 6390 to fulfill the internship requirement. Students are no longer eligible to enroll in BUAN 6009 if they have already completed BUAN 6V98 or BUAN 6390.

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