# BUSINESS ANALYTICS (BAX)

**Graduate School of Management**

## BAX 400 — Foundations of Analytics (4 units)

*Course Description:* Focuses on teaching the fundamentals of R and SQL. Introduces the topic of numerical optimization, and review the concepts of linear algebra and calculus.
*Learning Activities:* Lecture 3 hour(s).
*Grade Mode:* Letter.

## BAX 400V — Foundations of Analytics (4 units)

*Course Description:* Focuses on teaching the fundamentals of R and SQL. Introduces the topic of numerical optimization, and review the concepts of linear algebra and calculus.
*Learning Activities:* Web Virtual Lecture 4 hour(s).
*Grade Mode:* Letter.

## BAX 401 — Information, Insight & Impact (4 units)

*Course Description:* Introduction to the process of analyzing raw data to gain profitable business insight. Applications selected across organizational functions include prediction, process improvement, and general operational decision-making.
*Learning Activities:* Lecture 4 hour(s).
*Grade Mode:* Letter.

## BAX 401V — Information, Insight & Impact (4 units)

*Course Description:* Introduction to the process of analyzing raw data to gain profitable business insight. Applications selected across organizational functions include prediction, process improvement, and general operational decision-making.
*Learning Activities:* Web Virtual Lecture 4 hour(s).
*Grade Mode:* Letter.

## BAX 402 — Organizational Issues in Implementing Analytics (3 units)

*Course Description:* Review the evolution of analytics in business, how to assemble and manage analytics teams, and the decision life-cycle. Emphasis on structuring communications to improve buy-in from peers and non-quantitatively-inclined colleagues.
*Learning Activities:* Lecture 3 hour(s).
*Grade Mode:* Letter.

## BAX 403 — Organizational Effectiveness Workshop (2 units)

*Course Description:* Examine leadership, communication, and project management within the business, legal and societal contexts in which analytics is applied. Emphasis on privacy, data security, responsibility, and ethics.
*Learning Activities:* Lecture 2 hour(s).
*Grade Mode:* Letter.

## BAX 411 — Problem Structuring (2 units)

*Course Description:* Synthesize data-rich business challenges using analytic frameworks and techniques for modeling business problems. Emphasis on modeling uncertainty, optimizing multiple criteria, and building consensus.
*Learning Activities:* Lecture 2 hour(s).
*Grade Mode:* Letter.

## BAX 421 — Data Management (2 units)

*Course Description:* Introduction to the extraction, assembly, storage and organization of data in IT systems.
*Learning Activities:* Lecture 2 hour(s).
*Grade Mode:* Letter.

## BAX 422 — Data Design & Representation (2 units)

*Course Description:* Introduction to business applications involving standard, streaming, and network data. Emphasis on scalable technologies for processing and analyzing big data for diverse applications.
*Learning Activities:* Lecture 2 hour(s).
*Grade Mode:* Letter.

## BAX 423 — Big Data (4 units)

*Course Description:* Learn computational reasoning about data representations by mapping conceptual data models to relational structures and analyzing database architectures and design trade-offs.
*Learning Activities:* Lecture 4 hour(s).
*Grade Mode:* Letter.

## BAX 424 — Analytics for Logistics & Supply Chain Management (2 units)

*Course Description:* Introduction to various optimization methods in the domain of logistics and supply chains.
*Learning Activities:* Lecture 2 hour(s).
*Enrollment Restriction(s):* Open to students in Master of Business Analytics (MSBA) program only.
*Grade Mode:* Letter.

## BAX 431 — Data Visualization (2 units)

*Course Description:* Extract insights using visualization tools in R, Python, ManyEyes, HTML/CSS, etc. Standard (histograms, boxplots, and dashboards) and specialized (3D, animation, word clouds) formats are covered.
*Learning Activities:* Lecture 2 hour(s).
*Grade Mode:* Letter.

## BAX 441 — Statistical Exploration & Reasoning (4 units)

*Course Description:* Introduction to statistical reasoning and inference extraction from large data-sets. Learn to obtain preliminary insights and form initial hypotheses through exploratory data analysis (EDA).
*Learning Activities:* Lecture 4 hour(s).
*Grade Mode:* Letter.

## BAX 441V — Statistical Exploration & Reasoning (4 units)

*Course Description:* Introduction to statistical reasoning and inference extraction from large data-sets. Learn to obtain preliminary insights and form initial hypotheses through exploratory data analysis (EDA).
*Learning Activities:* Web Virtual Lecture 4 hour(s).
*Grade Mode:* Letter.

## BAX 442 — Advanced Statistics (4 units)

*Course Description:* Continue exploring statistical reasoning using maximum likelihood estimation, Bayesian models, nonparametric models, Monte Carlo Markov Chain, time series, model specification, model selection, and dimension reduction.
*Learning Activities:* Lecture 4 hour(s).
*Grade Mode:* Letter.

## BAX 443 — Analytic Decision Making (4 units)

*Course Description:* Using spreadsheets and specialized modeling tools, explore structured problem solution through meta-heuristics, Monte Carlo simulation, and mathematical optimization.
*Learning Activities:* Lecture 4 hour(s).
*Grade Mode:* Letter.

## BAX 452 — Machine Learning (4 units)

This version has ended; see updated course, below.
*Course Description:* Construct algorithms for learning from data and analyze the process for deriving business intelligence. Coverage of supervised and unsupervised learning, neural networks, etc.
*Learning Activities:* Lecture 4 hour(s).
*Grade Mode:* Letter.

**BAX 452 — Machine Learning & Artificial Intelligence (4 units)**

*Course Description:* Construct algorithms for learning from data and analyze the process for deriving business intelligence. Coverage of supervised and unsupervised learning, neural networks, etc.
*Learning Activities:* Lecture 4 hour(s).
*Grade Mode:* Letter.
This course version is effective from, and including: Spring Semester 2026.

## BAX 452V — Machine Learning & Artificial Intelligence (4 units)

*Course Description:* Construct algorithms for learning from data and analyze the process for deriving business intelligence. Coverage of supervised and unsupervised learning, neural networks, etc.
*Learning Activities:* Web Virtual Lecture 4 hour(s).
*Grade Mode:* Letter.

## BAX 453 — Application Domains (2 units)

*Course Description:* Explore contemporary and emerging domains for high-yield applications of analytics. Topics: social network analytics, search analytics, health care analytics, Internet of things, supply chain/operations analytics, and marketing analytics.
*Learning Activities:* Lecture 2 hour(s).
*Grade Mode:* Letter.

## BAX 453V — Application Domains (2 units)

*Course Description:* Explore contemporary and emerging domains for high-yield applications of analytics. Topics: social network analytics, search analytics, health care analytics, Internet of things, supply chain/operations analytics, and marketing analytics.
*Learning Activities:* Web Virtual Lecture 2 hour(s).
*Grade Mode:* Letter.

## BAX 461 — Practicum Initiation (2 units)

*Course Description:* Team formation. Scope projects relative to team capability and business opportunity. Create a preliminary structure and solution approach for the core problem, and assess data quality and project risks.
*Learning Activities:* Lecture 2 hour(s).
*Grade Mode:* Letter.

## BAX 461V — Practicum Initiation (2 units)

*Course Description:* Team formation. Scope projects relative to team capability and business opportunity. Create a preliminary structure and solution approach for the core problem, and assess data quality and project risks.
*Learning Activities:* Web Virtual Lecture 2 hour(s).
*Grade Mode:* Letter.

## BAX 462 — Practicum Elaboration (2 units)

*Course Description:* Building on problems chosen in BAX 461, teams refine the business opportunity and draw insights from exploratory data analysis.
*Learning Activities:* Lecture 2 hour(s).
*Grade Mode:* Letter.

## BAX 462V — Practicum Elaboration (2 units)

*Course Description:* Building on problems chosen in BAX 461, teams refine the business opportunity and draw insights from exploratory data analysis.
*Learning Activities:* Web Virtual Lecture 2 hour(s).
*Grade Mode:* Letter.

## BAX 463 — Practicum Analysis & Implementation (2 units)

*Course Description:* Focus on completing project deliverables by polishing statistical and non-statistical quantitative analysis, generating insights for technical and business stakeholders, integrating proposed solutions into partner workflows and organizations, and disseminating the findings and outcomes through presentations and publications.
*Learning Activities:* Lecture 2 hour(s).
*Grade Mode:* Letter.

## BAX 464 — Practicum Implementation (2 units)

*Course Description:* Project teams complete analysis, plan deployment and obtain client buy-in. Culminates in a project presentation, preferably including representatives from the client organization.
*Learning Activities:* Lecture 1 hour(s), Project, Term Paper, Discussion.
*Grade Mode:* Letter.

## BAX 490V — Topics in Business Analytics (2 units)

*Course Description:* Advanced topics in Business Analytics. Varied topics to cover subjects more extensively discussed in the MSBA core.
*Learning Activities:* Web Virtual Lecture 2 hour(s).
*Repeat Credit:* May be repeated when the topic differs.
*Grade Mode:* Letter.

## BAX 493 — People Analytics (2 units)

*Course Description:* Students develop an understanding of how to position themselves as strategic partners in a company's talent management efforts. Explore a range of topics related to people analytics, including hiring and selection, performance evaluation, training/development, promotion, compensation, social networks, diversity, and retention.
*Learning Activities:* Lecture 2 hour(s).
*Enrollment Restriction(s):* Open to students enrolled in the Masters in Business Analytics Program only.
*Grade Mode:* Letter.

## BAX 493A — Topics in Business Analytics (2 units)

*Course Description:* Advanced topics in Business Analytics. Varied topics to cover issues more extensively discussed in the program core or current interest topics in the fields of business, data, analytics, and implementation.
*Learning Activities:* Lecture 2 hour(s).
*Enrollment Restriction(s):* Open to students enrolled in the MSBA program only.
*Repeat Credit:* May be repeated when topic differs.
*Grade Mode:* Letter.

## BAX 493B — Topics in Business Analytics– Implementing Machine Learning on the Cloud (1 unit)

*Course Description:* Covers the four layers of Machine Learning in the cloud: AI services, ML services, ML Engines & Frameworks, and Infrastructure & Serverless Environments and how to implement solutions on all of the layers by using the best abstraction for the task at hand.
*Learning Activities:* Lecture 1 hour(s).
*Enrollment Restriction(s):* Open to students enrolled in the MSBA program only.
*Grade Mode:* Letter.