BUSINESS ANALYTICS

Graduate Program Head	Kevin Linderman
Program Code	BAN
Campus(es)	University Park (M.B.An.)
Degrees Conferred	Master of Business Analytics (M.B.An.)
The Graduate Faculty	View (https://secure.gradsch.psu.edu/gpms/?searchType=fac&prog=BAN)

The Master's in Business Analytics program focuses on developing the business analytics skills of professionals entering and engaged in business, non-business, and STEM career fields. Advances in technology have greatly enhanced the ability of organizations to capture large sets of structured and unstructured data; however, society's ability to organize, prepare, analyze, and exploit such data has not kept pace with these developments. Companies, governments, and nongovernmental organizations now seek qualified employees who can apply mathematics, statistics, computer science, and operations research techniques to small and large data sets to develop insights that will enhance business decision-making capabilities.

In order to develop highly-skilled business analysts capable of supporting data-driven business decisions, the M.B.An. program is built upon the widely-recognized progression of analytics development: descriptive, predictive, and prescriptive analytics. Through descriptive analytics (i.e., "What *has* happened?"), students develop skills in acquiring, organizing, cleaning, visualizing, and analyzing data from a wide range of business and non-business scenarios to help organizations understand their current operations. Advancing to predictive analytics (i.e., "What *will* happen?"), students use cutting-edge techniques (e.g., data mining) to detect patterns in data and project future outcomes based on past events. The M.B.An. program culminates with students learning prescriptive analytics (i.e., "What *should* happen?") skills, where students practice advanced analytics techniques such as simulation and optimization to help develop the best data-driven courses of action for complex business problems. Throughout the program, the curriculum requires students to apply theories, quantitative techniques, and academic research while thinking critically to solve "real" business problems. Group and individual assignments will challenge students to analyze case studies, build models, and communicate their solutions in both written and verbal form.

Admission Requirements

Applicants apply for admission to the program via the Graduate School application for admission (https://gradschool.psu.edu/graduate-admissions/how-to-apply/). Requirements listed here are in addition to Graduate Council policies listed under GCAC-300 Admissions Policies (https://gradschool.psu.edu/graduate-education-policies/).

Applicants must:

- Submit a completed online Graduate School Application for Admission (http://gradschool.psu.edu/prospective-students/how-to-apply/), including short admissions essay, resume, and three references with complete contact information.
  - Résumé reflecting relevant professional experience including internships and co-op experiences.
- Submit official transcripts from all post-secondary institutions attended (http://gradschool.psu.edu/prospective-students/how-to-apply/new-applicants/requirements-for-graduate-admission/).

GMAT and/or GRE scores will not be required for admission. Accordingly, these scores will not be accepted.

The language of instruction at Penn State is English. English proficiency test scores (TOEFL/IELTS) may be required for international applicants. See GCAC-305 Admission Requirements for International Students (https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-300/gcac-305-admission-requirements-international-students/) for more information.

Degree Requirements
Master of Business Analytics (M.B.An.)

Requirements listed here are in addition to Graduate Council policies listed under GCAC-700 Professional Degree Policies (https://gradschool.psu.edu/graduate-education-policies/).

Total credits required for the Master's in Business Analytics program is 30 credits at the 500- or 800-level, with at least 6 credits at the 500-level. One two- or three-credit elective course is required; this course may be at the 500- or 800-level.

There are 30 specified credits comprised of the following courses:

Code	Title	Credits
Required Courses		
BAN 830	Descriptive Analytics for Business	3
BAN 831	Business Data Visualization for Decision Making	3
BAN 832	Programming Skills for Business Analytics	3
BA 840	Business Data Management	3
BAN 840	Predictive Analytics for Business	3
BAN 841	Data Mining for Business	3
BA 804	Ethical Leadership	2
BA 817	Communication Skills for Management	2
BAN 550	Prescriptive Analytics for Business	3
Electives		**2-3**
Elective courses can be chosen from a list of approved courses maintained by the graduate program office. The list of elective courses may change over time based on feedback from students and industry.		
Culminating Experience		
BAN 888	Implementing Analytics for Business (Capstone Course)	3
Total Credits		**30**

Capstone
The Master's in Business Analytics program culminates with the project-based capstone course, BAN 888 Implementing Analytics for Business. BAN 888 allows students to apply their newly-developed business analytics problem-solving skills in real-world contexts. Topics include business and analytics problem framing; data sourcing, cleaning, and integration; analysis methodology selection; model building; model deployment; and model lifecycle management. A special emphasis is placed on communicating problems, methodologies, and solutions to executives not trained in statistics and other analytics disciplines.

In BAN 888, students explore each topic in a real-world context, developing business analytics solutions to an ongoing course project in a team setting. Topics in the capstone course align with the body of knowledge in the Institute for Operations Research and the Management Sciences (INFORMS) Certified Analytics Professional Study Guide, while the overall program prepares students who wish to pursue an Associate Certified Analytics Professional (aCAP) or Certified Analytics Professional (CAP) certification through the INFORMS-affiliated Certified Analytics Professional Program, depending on their level of professional analytics experience.

Minor

A graduate minor is available in any approved graduate major or dual-title program. The default requirements for a graduate minor are stated in Graduate Council policies listed under GCAC-600 Research Degree Policies (https://gradschool.psu.edu/graduate-education-policies/) and GCAC-700 Professional Degree Policies (https://gradschool.psu.edu/graduate-education-policies/), depending on the type of degree the student is pursuing:

- GCAC-611 Minor - Research Doctorate (https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-611-minor-research-doctorate/)
- GCAC-641 Minor - Research Master's (https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-641-minor-research-masters/)
- GCAC-709 Minor - Professional Doctorate (https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-700/gcac-709-professional-doctoral-minor/)
- GCAC-741 Minor - Professional Master's (https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-700/gcac-741-masters-minor-professional/)

Student Aid

Refer to the Tuition & Funding (https://gradschool.psu.edu/graduate-funding/) section of The Graduate School's website. Students in this program are not eligible for graduate assistantships.

Courses

Graduate courses carry numbers from 500 to 699 and 800 to 899. Advanced undergraduate courses numbered between 400 and 499 may be used to meet some graduate degree requirements when taken by graduate students. Courses below the 400 level may not. A graduate student may register for or audit these courses in order to make up deficiencies or to fill in gaps in previous education but not to meet requirements for an advanced degree.

Learning Outcomes

The Master's in Business Analytics program Learning Goals and Objectives include:

1. **Broad Core of Analytics Knowledge**
   M.B.An. graduates will master a broad core of analytics knowledge and be able to integrate and apply this knowledge to business situations as corporate managers and strategic partners in industries requiring interdisciplinary skills and global perspectives.

   Learning Objectives:

   - M.B.An. graduates will demonstrate advanced competency in the underlying concepts, theory, and tools taught in core business analytics programs.
   - M.B.An. graduates will be prepared to apply their knowledge of descriptive, predictive, and prescriptive analytics to identify, analyze, and recommend solutions to complex corporate strategic problems and projects requiring interdisciplinary and global perspectives.

2. **Analytical and Critical Thinking Skills**
   MBAN graduates will develop analytical and critical thinking skills needed to excel in today's business environment.

   Learning Objectives:

   - M.B.An. graduates will acquire the analytical and critical thinking skills needed to identify, analyze, and evaluate alternative solutions to problems and projects facing today's corporate managers and strategic planners.
   - M.B.An .graduates will develop the skills needed to craft and implement unique and "cutting edge" strategic and tactical plans.
   - M.B.An. graduates will be able to articulate and defend their analyses and recommended solutions to multiple audiences from business, government, and the community.
   - M.B.An. graduates will be able to integrate findings and analyses from cutting edge academic and practitioner research to problems and projects confronting corporate America.

3. **Interpersonal Skills**
   M.B.An. graduates will possess the interpersonal skills needed to impress hiring managers and become effective corporate managers and leaders.

   Learning Objectives:

   - M.B.An. graduates will be skilled at leadership, team building, interpersonal influence, and the management of change.
   - M.B.An. graduates will be able to communicate and work effectively with others in work settings involving cultural and demographic diversity.
   - M.B.An. graduates will become natural team leaders with the unique ability to identify and limit the phenomenon of "group think" that often plagues underperforming corporations. Graduates will draw out the high potential from their team members, leveraging the team's ability to analyze problems from many points of reference.

4. **Value System**
   MBAN graduates will be able to evaluate the ethical and societal implications of the corporate strategic decision-making for which they are involved and responsible.

   Learning Objectives:

   - M.B.An. graduates will be skilled at evaluating the impact of various courses of action on multiple stakeholders, including investors, lenders, customers, and the broader community.

These learning outcomes will be achieved by a combination of lectures by faculty and invited guest lecturers, reading of key literature, individual and team projects, and practical involvement in a business analytics capstone experience.

Contact

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