Master Programme BUSINESS ANALYTICS

Current as of October 1, 2020

Disclaimer: This is an unauthorized English summary of the curriculum. The official German version is the basis for all study matters and released by the Senate of the University of Vienna.

Overview

The goal of the Master programme Business Analytics is to familiarize students with the methods and instruments of predictive and prescriptive analytics required for business analyses and decision support. Students choose a more in-depth area of business administration, for which they then conduct data analyses and design, prototype and implement decision support systems. Students are able to independently solve and interpret business decision problems using extensive data sets and derive recommendations for action. The field of Business Analytics requires a high degree of analytical thinking. Students deepen both the theoretical and practical concepts of statistics, operations research, data science, and the design of information systems, taking into account business, ethical, and legal aspects of handling large amounts of data. In addition, students are prepared for a continuation of their university education within the framework of a PhD study in a subject of economics.

The master programme Business Analytics is a 2-year, full-time programme with 120 ECTS credits. Admission to the Master's programme requires the completion of a relevant Bachelor's programme (Business Administration, Mathematics, Computer Science, Business Informatics) a relevant post-secondary Bachelor's programme (e. g. Fachhochschule) or another equivalent programme at a recognised Austrian or foreign post-secondary educational institution. The master programme Business Analytics is taught in English and requires English knowledge of level B2. Students are selected through an admission procedure. Graduates are awarded the academic degree "Master of Science" (MSc).

Curriculum Overview

(1) Alternative compulsory module Foundations of Business Analytics (14 ECTS)
    a. Foundations of Business Analytics for Business Administration Students 14 ECTS *or*
    b. Foundations of Business Analytics for Computer Scientists 14 ECTS
(2) Compulsory module Advanced Analytics (14 ECTS)
    a. Advanced Business Analytics 6 ECTS
    b. Advanced Operations Research 8 ECTS
(3) Compulsory module group Doing Data Science, Ethical and Legal Issues (28 ECTS)
    a. Compulsory module Doing Data Science, Ethical and Legal Issues 12 ECTS
    b. Compulsory module Data Analysis Project and Seminar 16 ECTS
(4) Compulsory module Data Science Electives (12 ECTS)
(5) Alternative compulsory module group Business Administration (20 ECTS)
    a. Banking and Finance 20 ECTS *or*
    b. Marketing and International Marketing 20 ECTS *or*
    c. Supply Chain Management 20 ECTS *or*

d. Smart Production 20 ECTS *or*
e. Organisation and Personnel 20 ECTS *or*
f. Electronic Business (E-Business) 20 ECTS
(6) Compulsory module Business Analytics (4 ECTS)
(7) Compulsory module Master's Thesis Seminar (2 ECTS)
(8) Master's Thesis (24 ECTS)
(9) Master's Examination (2 ECTS)

Module Descriptions

(1) Alternative compulsory module Foundations of Business Analytics

FBA-BA Foundations of Business Analytics for Business Administration Students
Required pre-requisites: None
Recommended required pre-requisites: None
Module goals: Students learn how to use a programming language that is necessary for programming methods for data analysis and the development of optimization procedures. They learn about data modelling and the visualisation of large amounts of data. The module also serves to establish an equal level among all students.
Module structure: KU Programming for Business Analytics (course), 8 ECTS credits, 4 SSt (semester hour), pi (examination-immanent course) + KU Modelling and Handling of Large Databases (course), 6 ECTS, pi (continuous assessment)

FBA-CS Foundations of Business Analytics for Computer Scientists
Required pre-requisites: None
Recommended required pre-requisites: None
Module goals:
Students learn the basic concepts of decision-oriented business administration. They will become familiar with decision models of different areas of business administration and will be able to apply them appropriately to business administration problems. The module also serves to establish an equal level among all students.
Module structure: KU Foundations of Business Decision-Making (course), 8 ECTS credits, pi (continuous assessment) + KU Modelling and Handling of Large Databases (course), 6 ECTS, pi (continuous assessment)

(2) Compulsory module Advanced Analytics

ABA Advanced Business Analytics
Required pre-requisites: None
Recommended required pre-requisites: None
Module goals: The aim of this module is to communicate and deepen knowledge of statistics and analytics. Students should deal with methods of data analysis as they are used in different areas of business administration and acquire knowledge in quantitative modelling as well as in numerical solution techniques. They will gain a business perspective on data science methods and process models. The courses are methodologically oriented, but maintain a close relationship to the different business administration application areas.
Module structure: KU Advanced Business Analytics (course), 6 ECTS credits, pi (continuous assessment)

AOR Advanced Operations Research
Required pre-requisites: None
Recommended required pre-requisites: None
Module goals: The aim of this module is to communicate and deepen knowledge of operations research. Students should deal with methods of decision analysis as they are used in different areas of business administration and acquire knowledge in quantitative modelling as well as in numerical solution techniques. The courses are methodologically oriented, but maintain a close relationship to the different business administration application areas.
Module structure: KU Linear, Nonlinear and Integer Optimisation (course), 4 ECTS credits, pi (continuous assessment) + KU Graph Algorithms and Network Flows (course), 4 ECTS credits, pi (continuous assessment); or: KU Advanced Operations Research (course), 8 ECTS credits, pi (continuous assessment)

(3) Compulsory module group Doing Data Science, Ethical and Legal Issues

ELD Doing Data Science, Ethical and Legal Issues
Required pre-requisites: None
Recommended required pre-requisites: None
Module goals: In the course of an introductory project in heterogeneous teams, students acquire skills to successfully plan and solve application problems in the field of data science. Furthermore, students will learn about the ethical and legal challenges that arise when dealing with real data.
Module structure: VU Data Ethics and Legal Issues (lecture with integrated exercise), 6 ECTS credits, pi (continuous assessment); VU Doing Data Science (lecture with integrated exercise), 6 ECTS credits, pi (continuous assessment)

BAP Data Analysis Project and Seminar
Required pre-requisites: At least 22 ECTS credits from the compulsory module group Foundations of Business Analytics and the compulsory module group Advanced Analytics
Recommended required pre-requisites: None
Module goals: In the course of a project, students acquire the ability to solve data science projects using the methods and techniques that the students have already learned during their studies. In the course of the seminar, students acquire the ability to research, analyse and prepare relevant knowledge-based questions in the field of data science as well as the ability to work in a knowledge-based way, as required for the master thesis.
Module structure: LP Data Analysis Project (practical laboratory course), 12 ECTS credits, pi (continuous assessment); SE Research Seminar (seminar), 4 ECTS credits, pi (continuous assessment)

(4) Compulsory module Data Science Electives

DSE Data Science Electives
Required pre-requisites: None
Recommended required pre-requisites: Foundations of Business Analytics
Module goals: Students deepen their knowledge in the field of data science according to their own preferences in the areas of data mining, machine learning, analysis of high-dimensional data and data visualization.
Module structure: Students choose one or more courses from the field of computer science and business informatics in the total amount of 12 ECTS credits. The courses are listed in the course catalogue.

(5) Alternative compulsory module group Business Administration
Students choose a minor (alternative compulsory module) from the range of specialisation blocks

BAM-BF Banking and Finance
Required pre-requisites: None
Recommended required pre-requisites: None
Module goals: The aim of this module is a solid and well-founded financial education. Basic concepts from the areas of asset pricing and financial markets, banking and financial intermediation as well as corporate finance are taught.
Module structure: Compulsory courses: VO Basics of Finance (lecture), 4 ECTS credits, npi (non-continuous assessment) + KU Asset Pricing 1 (course), 4 ECTS credits, pi (continuous assessment) + KU Banking and Financial Intermediation (course), 4 ECTS credits, pi (continuous assessment) + KU Corporate Finance 1 (course), 4 ECTS credits, pi (continuous assessment); Elective course: Depending on the course offered, students choose any course from a financial field of the extend of 4 ECTS credits

BAM-MIM Marketing and International Marketing I
Required pre-requisites: None
Recommended required pre-requisites: None
Module goals:
Students are taught detailed knowledge of (international) marketing. They thereby gain an understanding of (international) marketing as an integrating corporate function. The knowledge acquired should enable graduates to manage their future company in a market-oriented manner.
Module structure: Compulsory courses 1: KU International Marketing Management 1 (course), 4 ECTS credits, pi (continuous assessment) + KU Consumer Behaviour (course, offered in German language), 4 ECTS credits, pi (continuous assessment) + KU Marketing Communication (course, offered in German language), 4 ECTS credits, pi (continuous assessment); Compulsory courses 2: KU International Marketing Management 2 (course), 4 ECTS credits, pi (continuous assessment) + KU Topics in International Marketing (course), 4 ECTS credits, pi (continuous assessment) + KU International Marketing Research (course), 4 ECTS credits, pi (continuous assessment); Elective courses 1: Depending on the course offered, students choose any course from a financial field of the extend of 4 ECTS credits; KU Market Research 1 (course)), 4 ECTS credits, pi (continuous assessment); KU International Marketing Research 1 (course), 4 ECTS credits, pi (continuous assessment); Elective courses 2: Depending on the course offered, students choose any course from a financial field of the extend of 4 ECTS credits; KU Shopper Marketing (course), 4 ECTS credits, pi (continuous assessment); KU International Marketing Simulation (course), 4 ECTS credits, pi (continuous assessment); UE Marketing Dramaturgy A (exercise), 4 ECTS credits, pi (continuous assessment); UE Marketing Dramaturgy B (exercise), 4 ECTS credits, pi (continuous assessment)
Language: This module can be completed in English. Some of the courses can be offered in German according to the possibilities. Recommended language level for these courses is knowledge of German at B2 level.

BAM-SCM Supply Chain Management I
Required pre-requisites: None
Recommended required pre-requisites: None
Module goals: The aim of this module is to provide students with profound knowledge in the field of supply chain management. The main focus is on quantitative methods. Students should be enabled to solve fundamental problems of supply chain management.
Module structure: KU Operations Strategy and Tactical Planning (course), 4 ECTS credits, pi (continuous assessment) + KU Supply Chain Management (course), 8 ECTS credits, pi (continuous assessment) + KU LP Modelling I (course), 4 ECTS credits, pi (continuous assessment) + KU Transportation Logistics (course), 4 ECTS credits, pi (continuous assessment)

BAM-SP Smart Production I
Required pre-requisites: None
Recommended required pre-requisites: None
Module goals: The aim of this module is to provide students with profound knowledge in the field of smart production. The main focus is on quantitative methods. Students should be enabled to solve basic problems of production planning.
Module structure: KU Operations Strategy and Tactical Planning (course), 4 ECTS credits, pi (continuous assessment) + KU Production Analysis (course), 8 ECTS credits, pi (continuous assessment) + KU Simulation I (course), 4 ECTS credits, pi (continuous assessment) + KU Logistics and Material Management (course), 4 ECTS credits, pi (continuous assessment)

BAM-OP Organisation and Personnel I
Required pre-requisites: None
Recommended required pre-requisites: None
Module goals: The module conveys central concepts of an analysis of organizations and personnel management. One focus is on an economic perspective, which is supplemented in an appropriate way by aspects of behaviour and social knowledge.
Module structure: KU Contracts, Coordination and Incentives (course), 4 ECTS credits, pi (continuous assessment) + KU Organisation Theory I (course), 4 ECTS credits, pi (continuous assessment) + KU Personnel Economics I (course), 4 ECTS credits, pi (continuous assessment) + SE Seminar on Organisation and Personnel (seminar), 4 ECTS credits, pi (continuous assessment) + KU Introduction to Economic Sociology (course), 4 ECTS credits, pi (continuous assessment)

BAM-EB Electronic Business
Required pre-requisites: None
Recommended required pre-requisites: None
Module goals: Students acquire basic as well as in-depth business management and interdisciplinary knowledge and skills in order to perform management tasks in the context of common information and communication technologies and to be able to solve them in a methodologically sound manner.
Module structure: Compulsory courses: KU Introduction to Electronic Business (course), 4 ECTS credits, pi (continuous assessment) + UE Case Studies of eBusiness and eLogistics (exercise), 4 ECTS credits, pi (continuous assessment) + SE Recent Developments in eBusiness and eLogistics, 4 ECTS credits, pi (continuous assessment); Elective course: Depending on the course offered, students choose any course from a financial field of the extend of 8 ECTS credits: UE Applications of eBusiness and eLogistics (exercise), 4 ECTS credits, pi (continuous assessment); UE Collaboration and eBusiness (exercise), 4 ECTS credits, pi (continuous assessment); KU eServices (course), 4 ECTS credits, pi (continuous assessment); KU Service Science (course), 4 ECTS credits, pi (continuous assessment)
Language: This module cannot be completed in English because the compulsory courses and some optional courses are offered in German. Recommended language level for these courses is knowledge of German at B2 level.
Recommendation: It is recommended to complete the "SE Recent Developments in eBusiness and eLogistics" after successful completion of the introductory course "KU Introduction to Electronic Business".

(6) Compulsory module Business Analytics (4 ECTS)

BAE Business Analytics Elective
Required pre-requisites: None
Recommended required pre-requisites: None
Module goals: Students supplement their knowledge according to their own preferences from the fields of business administration, economics, economic sociology, statistics and operations research.

Module structure: Students choose a course from the offer of the Faculty of Economic Sciences for 4 ECTS credits. Courses from the unselected Minor Business Administration or the courses KU Programming for Business Analytics or KU Foundations of Business Decision-Making of the alternative compulsory module (1) can also be selected. After prior approval by the programme director, relevant internship abroad or courses at other universities can also be taken into account.

(7) Compulsory module Master's Thesis Seminar

M-SE Master's Thesis Seminar
Required pre-requisites: Foundations of Business Analytics; Advanced Business Analytics; Advanced Operations Research; Doing Data Science, Ethical and Legal Issues; Data Analysis Project and Seminar
Recommended required pre-requisites: None
Module goals: The students are able to write a master's thesis and present an intermediate state of the thesis.
Module structure: SE Master's Thesis Seminar (seminar), 2 ECTS credits, pi (continuous assessment)

(8) Master's Thesis

The Master's thesis serves as proof of the ability to work on knowledge-related topics independently and in a way that is justifiable in terms of content and methodology. The topic of the Master's thesis can be taken from one of the compulsory or alternative compulsory modules. If a different subject is to be chosen or if there are uncertainties regarding the assignment of the chosen topic, a decision under study law is required. The master's thesis is worth 24 ECTS credits.

(9) Master's Examination

The prerequisite for admission to the Master's examination is the positive completion of all prescribed modules and examinations and the positive assessment of the Master's thesis. The Master's examination is a public defence. It consists of the defence of the Master thesis and an examination on its scientific environment. The assessment is carried out according to the provisions of the statutes. The master's examination is worth 2 ECTS credits.

Recommended Schedule

Semester Plan Master Business Analytics

1. Semester	Doing Data Science (6 ECTS)	Programming for Business Analytics (8 ECTS) / Foundations of Business Decicion Making (8 ECTS)	Advanced Business Analytics (6 ECTS)	Business Administration Minor (8 ECTS)
2. Semester	Data Ethics and Legal Issues (6 ECTS)	Advanced Operations Research (8 ECTS)	Modelling and Handling of Large Databases (6 ECTS)	Business Administration Minor (12 ECTS)
3. Semester	Research Seminar (4 ECTS)	Data Science Project (12 ECTS)	Data Sciene Electives (12 ECTS)	Business Analytics Elective (4 ECTS)
4 Semester	Master Thesis, Conversatorium for Master Candidates, Defensio (24 + 2 + 2 = 28 ECTS)			

Key
Core Lectures
Electives
Common lectures BA/DS/DH
Master Thesis