Kristiania

Programme description

Master of Science in Information Systems: Business Analytics

Part-time/Full-time

On-campus

120 ECTS credits

Valid from 2024

Full time *(two years)* or
Part time *(first 60 credits with 50% progression, last 60 credits with 100% progression)*

The programme is accredited by NOKUT 21.04.2020
The programme is re-accredited by the board 18.10.2022
The programme description is approved by
The Education Committee: 07.10.2022 (UU/EIT case no. 134/22)

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1. Introduction

Information Systems (IS) is both a professional discipline and an academic field, aiming to bridge the technical capabilities of IT with business needs. As an academic discipline, IS investigates a wide range of topics, such as IS strategy and management, business systems, IS development methods, user behaviour and usability. It also investigates more theoretical issues, such as the relationship between technology and the social world, and the dynamics of the information society.

Business analytics is the process of transforming data into actionable insights for making fact-based data driven decisions. The aim of this business analytics specialization is to facilitate learning of students towards understanding theories, frameworks, and concepts of descriptive, predictive and prescriptive analytics to support business decisions in an organization. The curriculum focuses to develop knowledge and skills concerning the theory and practice of planning and implementing analytics projects in organisations. The courses include Introduction to IS research, Data Management, Advanced Visual Analytics, Applied Statistics, and Applied and Big Data Analytics, and underpins this by enhancing students' core information systems understanding, including Ethics, Sustainability and Society, Research Methods, Proposal Development, tailoring them to meet the needs of this specialization. Business Analytics specialization is designed to help students acquire specialized analytical skills to develop data analytics projects to support decision-making and solve real-world business problems.

The awarded title is Master of Science in Information Systems.

IS Masters with specialization in Business Analytics are qualified to work as Data Analyst, Product Analyst, People Analyst, BI Developer, Data Specialist, IT Project Manager and more general Information Systems roles such as IT Managers, Business Analysts and Consultants. After completing the master's programme, the candidate is also formally qualified for a PhD study in a related area of research.

1.1 Prerequisites

Applicants must meet the following requirements:

- Bachelor's degree in IT, management, economics, e-business, statistics, or marketing, with an average grade of minimum C equals minimum 2,7 ECTS. Relevant practices, or other special considerations, may in some cases weigh up for non-compliant grade requirements.
- The applicants must also write a motivational letter of 400-500 words max in English.

Additional recommended competence:
For specialization in Business Analytics, we recommend a minimum of 15 credits in mathematics, programming, statistics, and/or econometrics. Relevant work experience, or other special considerations, may in some cases be a substitute for these requirements.

2. Objective

Learning outcome at the Master of Science in Information Systems programme level

Knowledge

The candidate...

- has an advanced knowledge of information systems as a research field, in terms of theories, knowledge claims, research methods and professional standards.
- can reflect on how information systems contribute to business, decision-making activities and societal aims.

Skills

The candidate...

- has acquired practical skills in analysing complex IS problems, designing or recommending solutions, and in measuring and evaluating results.
- has strong skills in applying research methods and techniques.

Competence

The candidate...

- can take responsibility for conducting independent research and/or development project at a high standard and in accordance with norms for research ethics.
- can choose the appropriate research approach, to choose or develop a solution that meets the organizational requirements, provide value while considering sustainability goals.
- can handle organizational relationships ethically, professionally, and to evaluate and communicate the results in a systematic way.

Learning outcomes at specialization level in Business Analytics

Knowledge

The candidate...

- can describe and discuss key theories on how data analytics can enhance the data-product creation process and support value creation in organizations.
- has both theoretical and practical experiences on how data analytics and visualisations can enhance the decision- making process and increase the competitive edge within organizations.

Skills

The candidate...

- has acquired statistical, decisional and analytical skills to develop and deploy solutions to support data-driven decision-making for real-world business problems.
- has the technical ability to employ visual, text or predictive analytics and to apply results to solve practical business problems.
- can design, develop, evaluate and reflect over analytics projects in an independent manner and communicate well with both technical and business stakeholders in an organisation.

Competence

The candidate...

- can apply their state-of-the- art knowledge and skills in enhancing the overall decision-making process in organizations through their ability to analyse and visualize internal and external (big) data.
- can carry out and manage business data analytics and data science projects, create and capitalize on data assets, evaluate results, and communicate findings ethically and professionally to subject experts and to the general public.

3. Structure

The courses are thought as modules, meaning that the students usually will complete one module before starting the next. For full-time students, first year offers eight courses. For part-time students, these eight courses are taken over two years. The second year (third year for part-time students) offers an elective/exchange semester and a Master Thesis semester. Full-time and part time students follow the same progression in their last academic year.

Semester	Master of Science in Information Systems: Business Analytics Full time			
1. semester	Introduction to IS Research 7,5 ECTS	Data Management 7,5 ECTS	Advanced Visual Analytics 7,5 ECTS	Ethics, sustainability and society 7,5 ECTS
2. semester	Introduction to Applied Statistics 7,5 ECTS	Applied and Big Data Analytics 7,5 ECTS	Research Methods 7,5 ECTS	Proposal Development 7,5 ECTS
3. semester	Elective 30 ECTS			
	Exchange 30 ECTS			
4. semester	Master Thesis 30 ECTS			

Table 1: Full-time program structure.

Compulsory courses	Elective courses

***** There may be changes in which electives/elective program course are offered

Semester	Master of Science in Information Systems: Business Analytics Part-time			
1. semester	Introduction to IS Research 7,5 ECTS	Advanced Visual Analytics 7,5 ECTS		
2. semester	Introduction to Applied Statistics 7,5 ECTS	Research Methods 7,5 ECTS		
3. semester	Data Management 7,5 ECTS	Ethics, sustainability and society 7,5 ECTS		
4. semester	Applied and Big Data Analytics 7,5 ECTS	Proposal Development 7,5 ECTS		
5. semester	Elective 30 ECTS			
	Exchange 30 ECTS			
6. semester	Master Thesis 30 ECTS			

Table 2: Part-time program structure.

Compulsory courses	Elective courses

*There may be changes in which electives/elective program course are offered

3.1 Academic progression

The academic progression presents the overall model for the Master of Science in Information Systems specialization in Business Analytics. The first year provides the students with knowledge and skills in Introduction to IS Research, Data Management, Advanced Visual Analytics, Ethics, Sustainability and Society, Introduction to Applied Statistics, Applied and Big Data Analytics, Research Methods, and Proposal Development.

The second year gives the students gives the opportunity to deepen within elective subjects and/or exchange to one of the international institutions that this programme has agreement with. The last semester has a stronger focus on competence, aiming at synthesizing knowledge and skills into the ability to conduct a Master Thesis. During the work with the Master Thesis the students have the opportunity to demonstrate expertise in their chosen research area. Student will acquire specialized problem-solving skills, being able to plan and conduct the steps in the research and/or development process at a high methodological standard. When working with the Master Thesis, a close relationship with a company is recommended.

The academic progression is described according to the full-time programme. Part-time students spend two years completing the first 60 credits (50% progression), while the last 60 credits are completed within one year (100% progression). See tables above for an overview of progress of study for full- and part time progression.

3.2 Courses

Course	Credits	Description
Introduction to IS Research	7,5	The course provides an introduction to the IS research field. Students will gain advanced knowledge of the key concepts and theories of IS research. They will acquire specialised problem-solving skills, being able to analyse and synthesize a research case. They shall take responsibility to a literature review of a specific IS topic. Central topics include Information Systems as a research field, IS development, IS innovation, IS as sociotechnical and complex systems, Introduction to research methods in IS, Basic concepts and theories in IS, Literature reviews and writing style.
Data Management	7,5	This course will provide students with an introduction to data management techniques, data warehousing and business intelligence. Students will gain advanced knowledge of key theories and concepts of data management processes, data collection, sharing and storage, data documentation, data compliance, data preservation, and an overview of the open data requirements of various funding sources. They will acquire specialized problem-solving skills, being able to analyse and prepare data management plans. They shall take responsibility to conduct an assessment and implementation of a data management plan and evaluate the business value.
Advanced Visual Analytics	7,5	Data and visual analytics are an evolving field concerned with analysing, modelling, and visualizing complex high-dimensional data. This course will introduce students to the data visualization domain by covering state-of-the-art modelling, analysis and advanced visualization techniques. It will emphasize practical challenges involving complex real-world data and include real- world case studies and hands-on work with several leading visual analytics tools and programming languages. Students will gain advanced knowledge of the art of decision- making, as well as acquire specialized problem-solving skills and deliver value to organizations through the development of advanced visualizations.
Ethics, sustainability and society	7,5	The main aim of this course is to provide students with the fundamental knowledge of ethics and sustainability necessary for responsible innovation and the development of new information technologies (IT) in the modern society. The central topics include the role of ethics in responsible innovation and IT development; social, economic, and environmental impacts of innovations and new ITs; and how IT development and innovation can contribute to achieving the UN Sustainable Development Goals. In covering ethical and sustainability issues, the course addresses the perspectives of various stakeholders at the individual level (IT developers, innovators, consumers, investors), the organizational level (commercial, public, and non-governmental organizations), and the societal level (local and regional communities, nations, international society). Group work on possible solutions to real-life ethical and sustainability challenges constitutes an essential part of the course.

Introduction to Applied Statistics	7,5	The course will focus on strengthening the theoretical principles of statistics with a focus on practical applications in business settings. The students will also gain experience working with data cleansing, use descriptive statistics to explore data, build simple statistical models, and learn techniques of communicating the results. Topics include but are not limited to: data transformations, descriptive statistics reporting, Central Limit Theorem, Elements of a statistical test, Type I and Type II errors, p-value, correlation, and dimensionality reduction. The course will also introduce a portfolio of basic data mining techniques necessary for extraction, transformation, cleansing and / or manipulation, analysis of data and communication of statistical results. The course will prepare the students for advanced data analytics courses.
Applied and Big Data Analytics	7,5	This course provides the forefront of knowledge using machine learning algorithms and techniques to deliver value for organizations. Students will gain advanced knowledge of key theories, frameworks, and concepts of data analytics and machine learning. They will acquire specialized analytical skills to develop data analytics projects to support decision-making and solve real-world business problems. On completion of this course, the students should understand the fundamental challenges of machine learning such as model assessment, selection, complexity, etc. and be able to implement machine learning using open-source machine learning libraries.
Research Methods	7,5	This course is intended as an introduction to research methodology and the research process. This introduction gives the students an overview of the basic concept, methods, and practice of research. Research is a cyclical process where new and carefully planned investigations build and extend on established work. The aim is to provide students with a fundamental understanding of research as a conceptual, empirical, and practical approach to gathering new insight and knowledge. The content provides a broad overview of how researchers work within the fields of economy, innovation, and technology. It presents students with relevant methods from these domains, along with their possibilities and limitations. Students will learn a systematic approach to empirical investigation, including literature search, research design and methodology, qualitative and quantitative analyses, and the presentation and evaluation of results. At completion of the course, students will be able to study and interpret existing research on a topic and suggest approaches to broaden or deepen knowledge within a given topic.
Proposal Development	7,5	The overall objective of this course is to help students conceptualize and prepare a timely and relevant research proposal, and to nurture a sense of inquisitiveness and active participation in research. The course aims at offering insight into the process behind a successful research project. It has an applied approach that involves collaborative and reciprocal partnerships between the university (faculty, staff, and/or students) and external communities for the mutually beneficial exchange of knowledge and resources. The research proposal forms the basis for the master thesis and the allocation of supervisor(s).

Table 3: Courses overview.

3.3 Elective subject

Within the students' 3rd semester (5th for the part-time students), they will have to choose from electable course in the program, which will give them the opportunity to further engage in in-depth knowledge of a topic of interest, or to broaden their scope and area of knowledge by selecting a related module that expands their horizon. What topics that can be chosen may vary from year to year. The concrete topics are presented and published therefore early in the spring, in the students' 2nd semester (4th for the part-time students), together with the deadline for enrolment in individual electable subjects. The proposed elective subjects are presented

below (all 7,5 ECTS).

Course	Credit	Description
Consulting and Leadership	7,5	This course focuses on the soft skills in management of information systems. Students will gain advanced knowledge of theories on leadership, change agents, ethics and required skills within IT-consultancy. They will acquire specialized problem-solving skills, being able to master the personal and organizational techniques required to participate in a change process, practicing leadership and developing professional skills within consulting. They shall take responsibility to conduct a minor consulting project thru an agreement, plan and evaluation.
Agile Project Management	7,5	Organizations need to develop project managers who can complete projects on time and within budget and this course addresses challenges such as the ability to manage projects and stakeholders, risk assessment and agile planning. Students will gain advanced knowledge of the key theories of project management and agile development. They will acquire specialised problem-solving skills, being able to plan and run a time-boxed iteration, and to use a project management tool. Students will take conduct plan, organise and control an agile IS project.
Text Mining	7,5	The aim of the course is to introduce the students to the concepts and techniques of natural languages processing and analysis, unstructured information analysis and management for better decision-making by deriving valuable insights from enterprise content regardless of source or format. The course provides deep and rich knowledge of text analysis techniques and applications including sentiment analysis and opinion mining, information access and text mining, document classification, topic extraction and other techniques and applications using real-world data and cases.
IT Governance	7,5	This course will provide the student with an understanding of IT Governance as an important activity for securing business value of IT investments. Students will gain advanced knowledge of key theories and frameworks of IT governance. They will acquire specialised problem-solving skills, being able to select and use a governance framework to analyse a business case. They shall take responsibility to plan, organise and evaluate an IT governance process.
Database Fundamentals	7,5	This course introduces business data processing employing database systems. The course will employ Structured Query Language (SQL) for fetching, aggregating, filtering, transforming data and investigating concepts for understanding automation of data processing.

Table 4: Suggested electives overview.

***** The students will be offered electives or recommended to take certain courses that align with the overall learning outcomes of the specialization.

3.4 Master Thesis (30 credits)

The aim of this course is to provide the student with an opportunity to develop systematic understanding and critical awareness on the solution of a relevant problem in the student's focal area. Students will gain advanced knowledge of the research process at Master level in information systems, including a deep knowledge of selected theories. They will acquire specialized problem-solving skills, being able to plan and conduct the steps in the research or development process at a high methodological standard. They shall take responsibility to conduct a well planned and executed project at Master level.

On a more detailed level, the student will, based on observations of the industry and the existing body of knowledge, develop a research question. Students will also be able to connect

their Master Thesis work to one of the ongoing research projects at School of Economics, Innovation and Technology. Furthermore, the student will conduct an extensive literature review in order to map what is already known about the chosen research question. Building on this, the student will carry out the research. This usually includes collecting his or her own data, which can be done by means of surveys, interviews, experiments, observations, and more. The data are to be analysed in a thorough manner before conclusions can be made. Lastly, the student has to reflect on ethical issues, limitations, future research and the value of the contributions of the conducted master thesis.

Course	Credit	Description
Master Thesis	30	The master thesis is a research project in which students will apply the knowledge acquired during their studies. It is a crafted scholarly document presenting research questions and original arguments based on scientific methods under the guidance of an advisor. The thesis gives the student the opportunity to demonstrate expertise in their chosen research area. Students will acquire specialized problem-solving skills, being able to plan and conduct the steps in the research and/or development process at a high methodological standard. They shall take responsibility to conduct a well planned and executed project.

Table 5: Master Thesis overview.

4. Teaching methods and assessment

4.1 Pedagogical platform and teaching methods

The programme uses a number of varied forms of teaching in order to encourage learning:

- Lectures, to introduce theoretical issues and domain knowledge.
- Seminars and group work, to give the students the opportunity to discuss different perspectives, integrate with previous knowledge, and practice analytical assessments with provided case materials.
- Practical assignments including developing IT artefacts.
- Directed and student-selected readings, to initiate an interest in a domain of knowledge and to develop solid knowledge base.
- Oral presentations, to develop personal communication skills and promote team-work environments.
- Essay and thesis writing, in order to synthesize knowledge and present analyses and communicate results.
- Supervision, to provide detailed feedback and discussion of students' projects in close interaction with Kristiania University College researchers.

4.2 Forms of assessment

Regarding assessment forms, the students usually written home exam during the modules. The objective of these assessment forms is to prepare and train the student for writing the Master's Thesis. In addition, some oral presentations, multiple choice exam, individual written exams are examples of other assessment forms. There is one assessment in each module. Some modules do also have individual or group compulsory assignments. For the Master's Thesis, the assessment consists of one written essay (The Master's Thesis report) and an oral defence.

5. Internationalization and student exchange

With reference to *Studietilsynsforskriften* of February 2017 (§2-2, sections 7 and 8), the study has arrangements for internationalization and international student exchange.

5.1 Internationalization

In this context internationalization is understood as placing the study programme in an international context and that the students are exposed to a multitude of perspectives. All of the reading materials and lectures are given in English, and the study uses both Norwegian and international cases. The students shall write their Master Thesis in English. The program uses international lectures and guest lecturers. Our lectures also conduct research with international co-authors and play an active role in both national and international conferences.

5.2 International student exchange

As regards to arrangements for international student exchange, Kristiania University College has the following mobility program:

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- Nordplus in the Nordic region or the Baltic States
- ERASMUS + in Europe
- "Study Abroad", for students in and outside Europe

Kristiania University College has agreements on student exchanges and academic relevance secured by the academic field of study. Exchange courses from partners are approved by academic supervisors, for admission to the program, with an equivalent of 30 credits.

For nominations for student exchange, requirements are set for grades and motivation applications.

For students at Master of Science in Information Systems: Business Analytics student exchange is possible during the third semester. For outgoing students, Kristiania University College, has established student exchange agreements with the following institutions:

- Kingston University, UK
- Arcada University of Applied Sciences, Finland
- Seoul National University of Science and Technology, South Korea
- University of Hertfordshire, UK
- Assumption University, Thailand

Changes to approved universities may occur. Information about possible exchange stays for the relevant year is therefore published online and on the learning platform.