



Programme description

# **Master of Science in Information Systems: Business Analytics**

120 credits

2020-2022

Full time and part time

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# 1. Introduction

The Department of Technology at Kristiania University College educates competent and socially responsible IT professionals, who work in many roles, such as CIOs, project managers, business analysts, consultants, systems developers and IT security experts. Master of Science in Information Systems is an advanced programme for students who aims for a career in Management or business systems. The programme is research based, and is taught by active researchers. The programme is also developed in close co-operation with business and public organisations.

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.

The awarded title is: Master of Science in Information Systems.

IS Masters work as CIOs, IT managers, business developers, software developers, business analysts, consultants and IT security staff. 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. 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 500 words max in English.

In addition, for the Master of Sciences in Information Systems: Business Analytics, courses in mathematics, programming, statistics, and/or econometrics are highly preferred.

## 2. Objective

### Learning outcome at programme level

#### Knowledge

Candidates will have an advanced knowledge of information systems as a research field, in terms of theories, knowledge claims, research methods and professional standards.

- K2. They will be able to apply this knowledge, and to reflect on how information systems contribute to business, decision-making activities and societal aims.

#### Skills

- S1. Candidates will acquire practical skills in analysing complex IS problems, designing or recommending solutions, and in measuring and evaluating results.
- S2. Candidates will also have strong skills in applying research methods and techniques.

#### Competence

- C1. Candidates will take responsibility for solving complex tasks and conducting a research project at a high standard in an organisation.
- C2. This includes the ability to choose the appropriate research approach, to choose or develop a solution, to handle relationships ethically and professionally, and to evaluate and communicate the results in a systematic way.

### 3. Structure

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 two courses, and a Master Thesis.

<b>Master of Science in Information Systems: Business Analytics Full-time</b>					
1st. semester	Introduction to IS Research 7,5 ects	Data Management 7,5 ects	Introduction to Data Mining & Applied Statistics 7,5 ects	Advanced Visual Analytics 7,5 ects	
2nd. semester	IT Governance 7,5 ects	Agile Project Management 7,5 ects	Text Mining 7,5 ects	Applied and Big Data Analytics 7,5 ects	
3rd. semester	Research Methods 7,5 ects	Master Thesis 45 ects			Elective 7,5 ects
4th. semester					

\*The courses are thought as moduels, meaning that the students usually will complete one module before starting the next.

<b>Master of Science in Information Systems: Business Analytics Part -time</b>				
1st. semester	Introduction to IS Research 7,5 ects	Introduction to Data Mining & Applied Statistics 7,5 ects		
2nd. semester	IT Governance 7,5 ects	Text Mining 7,5 ects		
3rd. semester	Data Management 7,5 ects	Advanced Visual Analytics 7,5 ects		
4th. semester	Agile Project Management 7,5 ects	Applied and Big Data Analytics 7,5 ects		
5th. semester	Research Methods 7,5 ects	Master Thesis 45 ects		Elective 7,5 ects
6th. semester				

\*The courses are thought as moduels, meaning that the students usually will complete one module before starting the next.

### 3.1 Academic progression

The first year provides the students with knowledge and skills in IS research, Data Management, Introduction to Data Mining & Applied Statistics, Advanced Visual Analytics, IT Governance, Agile Project Management, Text Mining and Applied and Big Data Analytics.

The second year has a stronger focus on competence, aiming at synthesising knowledge and skills into the ability to conduct projects. The shared courses of the second year prepare the student for the Master Thesis. During the work the student will be able to draw on and integrate all these resources. During the third semester an internship at a company is recommended.

### 3.2 Courses

Course	Credits	Description	Mapping to learning outcomes at program level*
<b>Introduction to IS Research</b>	7,5	<p>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.</p> <p>Central topics includes 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.</p>	K1
<b>Data Management</b>	7,5	<p>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 analyze 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.</p>	K2, S1, C1 and C2

<p><b>Introduction to Data Mining &amp; Applied Statistics</b></p>	<p>7,5</p>	<p>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, Random variables, Binomial distribution, Normal distribution, Central Limit Theorem, point estimation and interval estimation of population mean, proportion and variance, Elements of a statistical test, Type I and Type II errors, Test on a population mean, proportion and variance, p-value, Power of a test, Relation between hypothesis testing and confidence interval estimation, correlation, dimensionality reduction.</p> <p>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.</p>	<p>K2, S1, C1 and C2</p>
<p><b>Advanced Visual Analytics</b></p>	<p>7,5</p>	<p>Data and visual analytics are an evolving field concerned with analyzing, modeling, and visualizing complex high-dimensional data. This course will introduce students to the data visualization domain by covering state-of-the-art modeling, 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.</p>	<p>K2, S1, C1 and C2</p>
<p><b>IT Governance</b></p>	<p>7,5</p>	<p>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</p>	<p>K2, S1, C1 and C2</p>

		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.	
<b>Agile Project Management</b>	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. They shall take responsibility to conduct plan, organise and control an agile IS project.	K2, S1, C1 and C2
<b>Text Mining</b>	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.	K2, S1, C1 and C2
<b>Applied and Big Data Analytics</b>	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.	K2, S1, C1 and C2
<b>Research Methods</b>	7,5	The aim of the course is to provide a methodological foundation for the Master Thesis. Students will gain knowledge of	S2, C1 and C2

		epistemologies and relevant methods for Information Systems. They will acquire specialized problem-solving skills, being able to conduct a systematic data collection and analysis. They shall take responsibility to conduct the steps of a research project, according to professional and ethical standards.	
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\* Master Thesis is linked to the following learning outcomes at program level: S2, C1 and C2

### 3.3 Elective subject

Within the students' 3th semester they will have to choose one 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, together with the deadline for enrolment in individual electable subjects.

### 3.4 Master Thesis (45 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, Department of 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 limitations, future research and the value of the contributions of the conducted master thesis.

## 4. Internationalisation and student exchange

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

### 4.1 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 lecturers also conduct research with international co-authors and play an active role in both national and international conferences.

For specific internationalization schemes, see the subject description of the study.

### 4.2 International student exchange

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

- 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. While on exchange the student will be able to start their master thesis with an advisor from Kristiania University College. 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](#), Sør-Korea
- [University of Hertfordshire](#), UK
- [Otago Polytechnic New Zealand](#), New Zealand (1 student only)
- [TIAS School for Business and Society, The Netherlands](#) (MoU is signed, but the final agreement is pending NOKUT's approval of this specialisation)

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

## 5. 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 assessment with case materials.
- Practical assignments and lab work, to develop hands-on technical skills
- Directed and student-selected readings, to develop a solid knowledge base
- Oral presentations, to develop personal communication skills
- Essay and thesis writing, in order to synthesise knowledge and present analyses and results
- Supervision, to provide detailed feedback and discussion of student projects in close interaction with researchers at Kristiania University College.

### 5.1 Forms of assessment

Regarding assessment forms, the students usually write essays 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, written exams and lab work are examples of other assessment forms. There is one assessment in each module. For the Master's Thesis, the assessment consists of: one written essay (The Master's Thesis report) and an oral presentation.