

## **Programme Curriculum for Master Programme in Information Systems**

### **1. Identification**

Name of programme	Master Programme in Information Systems
Scope of programme	60 ECTS credits
Level	Master level
Programme code	EAGIF
Decision details	Board of the School of Economics and Management
Amendment details	29 May 2019

### **2. Programme description**

The objective of this master programme is that students, after completion, have acquired a deeper understanding and knowledge of important facets of Information Systems (IS), Information Systems Design (ISD) and Information and Communication Technology (ICT).

This programme focuses on how information and communication technologies and artificial intelligence can be used to achieve strategic goals, and how to design and develop modern information systems, which are flexible to the goals and needs of the organisation. You will gain a deeper understanding of the wider business context of information systems and how digitalisation affects organisations.

Since information systems are prevalent in almost every aspect of modern business and are required to achieve today's business strategies, it is important to understand the wider business context of information systems as well as how they should be designed to reach sound technical performance and interaction qualities. Modern information systems do not have to be limited to the standard desktop computer or terminal and can be designed for user needs of mobile workers or business men, which places new demands on design work and interaction models. Likewise, many of the bread-and-butter systems are either already built (and exist as legacy systems) or are nowadays ICT commodities bought in the form of COTS (Commercial off-the-shelf) like Enterprise Resource Planning (ERP) systems, Supply Chain Management (SCM) systems, Business Process Management Systems (BPMS), Enterprise Decision Management (EDM) systems, and so on. These are then deployed in the organisation. Thus, the role of IS and ISD changes to accommodate new use patterns and business processes and strategies in a world of agile and global e-Businesses.

The overall goal of the programme is to provide students with an advanced understanding of these aspects of IS and ISD. Following this comprehensive goal, theoretical concepts, models and tools will be compared with real and complex problems in IS and ISD in order to train students in advanced

problem solving. The programme also aims at introducing, explaining and applying the methodological aspects of studying ISD.

The programme is capabilities-driven which means that after completing the programme the students have specific valuable IS design capabilities and skills. The programme serves to provide the students with deepened and thorough knowledge of IS theories, concepts, techniques and their applications.

#### *Career opportunities*

Graduates from this programme are in high demand as organisations rely on information systems experts to understand, design and develop systems that help them remain competitive in today's global marketplace. The programme provides outstanding career opportunities both nationally and internationally, and is aimed at students seeking to pursue careers that links technology, people and business.

#### *Connection to further studies*

Successful completion of the programme will enable students to apply to postgraduate studies at the doctoral level in information systems.

### **3. Learning outcomes**

The programme builds on previous studies at the undergraduate level in information systems related subject matters. In accordance with the Higher Education Ordinance, a Master of Science (60 credits) is awarded to students who at the completion of the programme accomplish the following:

#### *Knowledge and understanding*

- demonstrate knowledge and understanding within the field of information systems, including both a broad command of the field and deeper knowledge of certain parts of the field, together with insight into current research and development work; and
- demonstrate deeper methodological knowledge in the field of information systems.
- demonstrate thorough knowledge and understanding of information systems, with a particular emphasis on the methods and practices of information systems design;
- demonstrate an understanding of how information systems theories and models can be used to analyse a broad range of problems in today's business and society.

#### *Skills and abilities*

- demonstrate an ability to integrate knowledge and to analyse, assess and deal with complex phenomena, issues and situations, even when limited information is available;
- demonstrate an ability to independently identify and formulate issues and to plan and, using appropriate methods, carry out advanced tasks within specified time limits;
- demonstrate an ability to clearly present and discuss their conclusions and the knowledge and arguments behind them, in dialogue with different groups, orally and in writing; and
- demonstrate the skill required to participate in research and development work or to work in other advanced contexts.
- demonstrate an ability to solve information systems design problems;
- demonstrate an ability to integrate methods from different areas of organisation, management, information systems, and information and communication technology.
- demonstrate an ability to work individually as well as in groups with students from different cultures in order to solve practical problems as well as to manage a more extensive project.

*Judgment and approach*

- demonstrate an ability to make assessments within information systems, taking into account relevant scientific, social and ethical aspects, and demonstrate an awareness of ethical aspects of research and development work;
- demonstrate insight into the potential and limitations of science, its role in society and people's responsibility for how it is used; and
- demonstrate an ability to identify their need of further knowledge and to take responsibility for developing their knowledge.

*Independent project (degree project)*

For a Master of Science (60 credits) students must have completed an independent project (degree project) worth at least 15 higher education credits in information systems within the framework of the course requirements.

**4. Course information**

The programme has the following structure:

Semester 1 (Autumn), year 1		Semester 2 (Spring), year 1	
Period I Sept-Oct	Period II Nov-Dec	Period III Jan-March	Period IV April-June
<i>At least three of these courses will be offered:</i>		<i>At least two of these courses will be offered:</i>	
Business Intelligence (7.5 cr)		Business Intelligence (7.5 cr)	Degree Project (15 cr)
Business Decision Management (7,5 cr)		Business Decision Management (7.5 cr)	
Designing Digitalisation (7.5 cr)		Designing Digitalisation (7.5 cr)	
Business Processes and Artificial Intelligence (7.5 cr)		Business Processes and Artificial Intelligence (7.5 cr)	
Human-Computer-Interaction Design (7.5 cr)		Human-Computer-Interaction Design (7.5 cr)	
IT, Innovation, and Sustainability (7.5 cr)		IT, Innovation, and Sustainability (7.5 cr)	
Mobile Industry Dynamics (7.5 cr)		Mobile Industry Dynamics (7.5 cr)	
Strategic Management and IS (7.5 cr)		Strategic Management and IS (7.5 cr)	
<i>Compulsory:</i>			
Information Systems Research Methods (7.5 cr)			

The programme consists of several parts, each comprising distinct courses (in total 60 ECTS credits):

- Semester 1 (30 ECTS credits): Information Systems Research Methods (compulsory) and at least the programme offers three courses from: Business Intelligence; Business Decision Management; Designing Digitalisation; Business Processes and Artificial Intelligence; Human-Computer-Interaction Design; IT, Innovation, and Sustainability; Mobile Industry Dynamics; Strategic Management and IS.
- Semester 2 (30 ECTS credits):
  - Period III (15 ECTS credits): At least the programme offers two courses from: Business Intelligence; Business Decision Management; Designing Digitalisation; Business Processes and Artificial Intelligence; Human-Computer-Interaction Design; IT, Innovation, and Sustainability; Mobile Industry Dynamics; Strategic Management and IS.
  - Period IV (15 ECTS credits): Degree Project.

Note: a course in the programme will not be offered more than once every academic year.

### **First semester**

The first semester comprises two periods. In each period, at least two courses will be offered including the course Information Systems Research Methods (compulsory). The offered courses available run parallel during the first and second half of the semester:

*Business Intelligence, 7.5 ECTS credits.* The course concentrates on design of Business Intelligence (BI) solutions. BI is a broad category of applications, technologies, and processes for gathering, storing, accessing, and analysing data to help business users make better decisions and take actions. The students should acquire knowledge on how to design BI solutions for different BI targets. Three specific BI targets can be identified: 1) point solutions, single or a few related applications, 2) enterprise-wide BI, providing organisational BI infrastructure, and 3) BI to support organisational transformation, enabling new business models. The BI targets differ in terms of their focus; scope; level of sponsorship, commitment, and resources required; technical architecture; impact on personnel and business processes; and benefits. Issues related to BI data management (from separate BI databases to real-time data warehousing), meta-data, data quality, BI governance, and BI benefits are addressed. Contemporary BI trends will be covered. The trends include, scalability (more data, more users, and more complex queries), pervasive BI, operational BI, and the BI-based organisation (how organisations can compete on analytics).

*Business Decision Management, 7.5 ECTS credits.* Through this course you will be able to understand the design and implementation of highly servitized and agile businesses where processes and decisions are managed as two distinct but interrelated aspects and assets. In more detail you will: further your understanding of the need for Separation of Concerns in Information Systems Design (ISD); learn how to design, model and manage operational business decisions according to Decision Model and Notation (an OMG standard); learn how to digitalize, automate and manage decision logic using a Business Rules Management System (BRMS) for hot deployment; learn business process modelling on a basic level to automate operational work flows that connect decision tasks to decisions services.

*Designing Digitalisation, 7.5 ECTS credits.* The course focuses on the opportunities and challenges, and the forces driving digitalisation of society, modern organisations, businesses and industries. This includes design, societal, ethical and environmental aspects, as well as managerial concerns from a local and global perspective. After completing the course, a student will be well prepared by theories, methods and techniques to participate in the digital transformation.

*Business Processes and Artificial Intelligence, 7.5 ECTS credits.* From the perspective of Business Processes (BP) being the nerve system of a business, all organisations are affected by and dependent

on BPs, their design and digitalisation. Most of today's managerial work requires knowledge and toolsets to manage BPs and business decisions to be supported by and automated through Artificial Intelligence (AI). Moreover, to get real business value from AI, businesses must focus their efforts in AI on improving business decisions. This course aims to provide an insight into designing the Business Processes, business decisions and Artificial Intelligence that are building today's businesses. On completion of the course, students shall have a thorough understanding of how BPs, business decisions and AI shape today's businesses and their design. Students shall be able to identify problems that can be solved by, or decisions that can be made or supported by AI in a business process and be able to implement solutions to aid the aforementioned.

*Human-Computer-Interaction Design, 7.5 ECTS credits.* The HCI Design course concentrates on user-centred design and design theory of digital artefacts. The course consists of three parts: theory, design workshops, and a design project. Course lectures progress through four segmented sections: interaction design and system development, interaction design versus traditional design work, UbiComp (Ubiquitous Computing) and interaction design beyond the desktop, methods and models for interaction design. Students work in groups of three to five on projects that they specify, and seek and explore non-traditional uses of computing and ICT artefacts.

*Mobile Industry Dynamics, 7.5 ECTS credits.* The objective of this course is to provide a thorough overview of the commercial landscape and dynamics of the mobile industry - spanning from the old world of telecoms to the new world of software. This industry is moving faster than any other - reinventing markets, destroying inflexible business models and spawning new ones. An industry where the products are defined by \$10 billion networks and manufacturers, but the innovation is in part defined by software developers in a garage. Areas covered in the course are the competitive technology landscape, the dynamics and culture of handset manufacturers and network operators, the regional market differences, and the internet players driving mobile to the software era. After completion of the course objectives the student will be able to analyse the business models and strategies of handset manufacturers and network operators, and foresee the market trends that are shaping up dramatic changes in this \$1 trillion market.

*IT, Innovation, and Sustainability, 7.5 ECTS credits.* The course examines how ICT can be used as a tool that enables evaluation and innovation in how firms communicate and optimize environmental performance. The course further discusses sustainability from a Green IT perspective, where focus is on manufacturing, using and disposing of IT related products such as computers, servers, printers, monitors and network solutions. The end result of the course should be an increased understanding of how Green IT is a sustainability issue that companies and individuals need to relate to. After completion of course objectives, the student will have the ability to validate total cost of ownership of the IT infrastructure, understand how companies can increase IT effectiveness and efficiency and thereby lower their carbon footprint, as well as have an ability to discuss IT's role in any formal sustainability programme.

*Strategic Management and Information Systems, 7.5 ECTS credits.* The course gives increased knowledge in Strategic Planning of ICT support for business development, and provides a clear understanding of control principles for coordination of business development and ICT. The course examines strategic structures in the enterprise. Further the course covers control models for business oriented IT-Governance. Control of ICT investments and ICT costs related to enterprise efficiency and business development is studied. The course addresses planning, control, and use of enterprise systems in organisations.

*Information Systems Research Methods, 7.5 ECTS credits.* The course deals with some of the most common qualitative and quantitative research methods and techniques used within information systems research and advanced professional investigation. The course also deals with design science research in information systems and technology. Different assumptions concerning the nature of the world and our knowledge about it, as well as the purpose of research, are discussed in relation to

various research methods and techniques. The course also brings to the fore the issue of writing up research, i.e. the written presentation of research results.

### Second semester, first half

The first part of the second semester offers at least two IS-courses (see, the table above).

### Second semester, second half

The last study period will focus entirely on the Master degree project. We expect students to formulate a clear and researchable research question at the beginning of this final period. At the start of the period, a relevant supervisor will be assigned to each degree project.

*Degree Project, 15 ECTS credits.* Students work in pairs and conduct original research within a relevant IS/ISD area that is related to the overall perspective of the programme. At the end of the final period, each project will be presented, discussed and defended at a final seminar.

## 5. Degree

Upon completion of the programme a Master of Science (60 credits) major Information Systems (*Filosofie magisterexamen, huvudområde informationssystem*) will be awarded in compliance with the National Higher Education Ordinance (SFS 2006:1053).

## 6. Admission requirements and selection criteria

An undergraduate degree (BA/BSc) with at least 60 ECTS credits of IS related courses. These must include: 1) Foundations and Role of IS, 2) Systems Analysis and Design, 3) Data and Information, 4) Human-Computer Interaction, and 5) Organisation and IS. English 6.

### Selection criteria

Selection will be based on academic merits from university studies and a Statement of purpose in which applicants should state their reasons for applying to the programme.

## 7. Other information

Courses at the School of Economics and Management are graded according to the criterion-referenced principal grades A-F:

GRADE		POINTS	CHARACTERISTIC
A	Excellent	100-85	A distinguished result that is excellent with regard to the following aspects – theoretical depth, practical relevance, analytical ability and independent thought.
B	Very good	84-75	A very good result with regard to the above mentioned aspects.
C	Good	74-65	The result is of a good standard with regard to the above mentioned aspects and lives up to expectations.
D	Satisfactory	64-55	The result is of a satisfactory standard with regard to the above mentioned aspects and lives up to expectations.
E	Sufficient	55-50	The result satisfies the minimum requirements with regard to the above mentioned aspects, but not more.
F	Fail	49-0	The result does not meet the minimum requirements with regard to the above mentioned aspects.

It is up to the teaching professor to decide whether the credits of a course should be converted into a total of 100 points for each course, or if the scale above should be used as percentage points of any chosen scale instead.

*Academic Integrity*

The University views plagiarism very seriously, and will take disciplinary actions against students for any kind of attempted malpractice in examinations and assessments. The penalty that may be imposed for this, and other unfair practice in examinations or assessments, includes suspension from the University.