

Curriculum and Module Handbook

Master's Degree Programme

in Information Systems

(Master of Science in Information Systems)

2015

1 September 2015

Curriculum developed by:

Dr Oliver Müller, Assistant Professor, University of Liechtenstein

Dr Bernd Schenk, Senior Lecturer, Executive Director (of Programme) MSc in Information Systems, University of Liechtenstein

Prof Dr Stefan Seidel, Associate Professor, Academic Director (of Programme) MSc in Information Systems, University of Liechtenstein

Prof Dr Jan vom Brocke, Head of the Institute of Information Systems, University of Liechtenstein

External advisor:

Prof Dr Jan Recker, Queensland University of Technology, Brisbane, Australia

Content

1. Study programme profile	4
1.1. Qualification profile	4
1.2. Entry requirements	5
1.3. Learning outcomes	5
1.4. Programme structure	5
2. Formal aspects	7
3. Module structure	8
4. Module handbook	9

1. Study programme profile

Information systems (IS) have been the main contributor to productivity growth over the past decades and are pivotal to contemporary organisations in a global, rapidly changing economy. Business organisations manage their processes through enterprise systems, our private and professional communication has changed dramatically due to emergent mobile technologies and social media platforms, and countless complementary IS enabled innovations affect our life and work on a daily basis. Managers and professionals across different industries thus require unique abilities in making strategic decisions about the development and use of information systems, identifying the potentials for innovation originating from information systems, and understanding how business processes which use the transformative power of information systems to increase productivity, quality, and sustainability can be designed and implemented.

The Master's degree programme in Information Systems provides these skills, thereby focusing on the nexus between information technology and business. Two specialisations in **Business Process Management** and **Data Science** allow for further specialisation in two important areas. Business Process Management is a management field which focuses on the design, implementation, execution, and continuous improvement of business processes. Data Science is a field which focuses on using both qualitative and quantitative data to turn information into innovation and competitive advantage. The programme thus provides graduates with skills which are needed in a fast-changing digital world.

The programme has been developed based on industry demands in terms of required knowledge, understanding, and methodological skills. It is aimed particularly at fostering professional careers in international settings through collaboration with international corporations as well as seminars with international partner universities. Rigorous scientific training also provides a foundation for careers in academia.

The study programme is consistent with the university's strategy in that it (a) follows a strategy of excellence in selecting students and teaching staff, (b) focuses on information systems (Wirtschaftsinformatik) as one of the university's foci of high economic and societal relevance, and (c) pursues both regional relevance (through industry collaboration) and international outreach (through an international student body and teaching staff as well as collaboration with international partners).

1.1. Qualification profile

Graduates of the Master's degree programme in Information Systems at the University of Liechtenstein will be able to:

- a) design, implement, and manage information systems,
- b) identify and exploit the opportunities created by digital innovations,
- c) demonstrate skills in leadership and collaboration in IS, and
- d) demonstrate skills in designing and conducting information systems research projects.

The Master's degree programme in Information Systems, with its specialisations in Business Process Management and Data Science, provides well-grounded methodological competencies at the intersection between information technology and business that are required in a digital world. At this, the programme focuses on skills related to both improving organisational efficiency and innovativeness using the transformative power of information systems.

As a part of international project teams with members from partner universities, students develop social competencies that are highly relevant in the dialogue between various stakeholders and business sectors. Students learn to take leadership roles and meet the challenges of a global, fast-changing, and increasingly digital economy. Graduates of the Master's degree programme in Information Systems are thus well prepared for careers as future leaders in IT and management in internationally operating businesses.

The **specialisation in Business Process Management** focuses on methodological competencies for the analysis, implementation, improvement, and continuous management of business processes.

The **specialisation in Data Science** focuses on methodological competencies in business intelligence, analytics, and decision theory for turning information into competitive advantage and innovation.

The programme is complemented by a number of cross-faculty elective subjects from which students can select. These subjects focus on interdisciplinary topics, including social and ethical aspects.

1.2. Entry requirements

The Master's degree programme in Information Systems builds upon a relevant bachelor's programme or an equivalent university programme. Further details can be found in our [Admission Guidelines](#).

1.3. Learning outcomes

Learning outcomes are defined in terms of (a) knowledge and understanding, (b) applied knowledge and understanding, (c) generic cognitive skills, (d) communication, and (e) learning strategies, in accordance with the NQ.FL-HS guidelines. Learning outcomes are based on knowledge pertaining to the bachelor's level.

Knowledge and understanding

Our graduates

- demonstrate knowledge and understanding which cover and integrate the main characteristics, boundaries, concepts, methods and theories of information systems and management
- prove a critical understanding of the intellectual and ethical issues related to information systems

Applied knowledge and understanding

Our graduates

- show problem solving abilities using appropriate methods to analyse, design, and implement information systems
- develop digital innovations

Generic cognitive skills

Our graduates

- integrate knowledge and are capable of handling the complexity associated with information systems as socio-technical systems
- make appropriate decisions, under consideration of ethical and social aspects

Communication

Our graduates

- communicate research results at an expert level in a variety of roles and contexts
- use appropriate methods to communicate to a range of audiences with different levels of knowledge and expertise

Learning strategies

Our graduates

- exercise autonomy and initiative in carrying out the self-directed programme of study or research projects
- demonstrate capacity to manage time and physical resources as an individual and as a group member and to collaborate with peers and others in sharing knowledge and research

1.4. Programme structure

The Master's degree programme in Information Systems is arranged in a modular structure and is characterised by both its academic rigor and practical relevance. The programme comprises four semesters of full-time study corresponding to 120 ECTS credits (European Credit Transfer System).

Compulsory courses (Semesters 1 and 2)

The compulsory courses of the first and second semesters provide the necessary concepts, theories, and methods to successfully design, implement, and execute projects in the field of IS. Table 1 provides an overview.

Table 1: First and second semester modules

Semester	Module	ECTS
1	Management Information Systems	9
1	Process & Data Management	3
1	Cyber Security ¹	3
1	Business Statistics I	3
1	Research Methods	6
1	Innovation Lab I	3
1	Cross-faculty Elective Subject 1	3
Sum ECTS First Semester		30
2	Systems Analysis & Design	6
2	Supply Chain Management	6
2	Leadership and Management	6
2	Business Statistics II	3
2	Innovation Lab II	3
2	Cross-faculty Elective Subject 2	3
2	Cross-faculty Elective Subject 3	3
Sum ECTS Second Semester		30

Specialisations (Semester 3)

Students select one of two specialisations – Data Science or Business Process Management. The specialisations comprise 30 ECTS and are taught in the third semester. One out of the four cross-faculty elective subjects may be replaced by an elective offered within the programme (this includes modules from the respective other specialisation).²

Specialisation in Business Process Management

The specialisation in Business Process Management focuses on methodological competencies for the analysis, implementation, improvement, and continuous management of business processes. Table 2 provides an overview.

Table 2: Specialisation in Business Process Management

Semester	Module	ECTS
3	Process Analysis	9
3	Process Implementation	6
3	Process Management	6
3	Project Seminar BPM	6
3	Research Seminar BPM (Preparation for master's thesis)	3
Total ECTS in the Third Semester		30

¹ Amended by Senate resolution on May 2, 2018

² This paragraph has been amended by a Senate resolution on March 2, 2016.

Specialisation in Data Science

The specialisation in Data Science focuses on methodological competencies for turning data into innovation and competitive advantage. Table 3 provides an overview.

Table 3: Specialisation in Data Science

Semester	Module	ECTS
3	Data management	6
3	Business Intelligence	6
3	Data Mining & Predictive Analytics	6
3	Decision Theory	3
3	Project Seminar Data Science	6
3	Research Seminar Data Science (Preparation for master's thesis)	3
Sum ECTS Third Semester		30

Master's thesis (Semester 4)

The fourth semester is focused on the master's thesis. The master's thesis needs to be supervised at the University of Liechtenstein. In their master's thesis, students use scientific methods and work in accordance with standards of scientific writing. The master's thesis is typically related to the specialisation (Business Process Management or Data Science) selected by the student. The master's thesis is defended in an oral exam, where students may be asked questions related to their studies which may go beyond the content of their master's thesis. Table 4 provides an overview of the fourth semester modules.

Table 4: Fourth semester modules

Semester	Module	ECTS
4	Master's Thesis	27
4	Cross-faculty Elective Subject 4	3
Sum ECTS Fourth Semester		30

2. Formal aspects

The curriculum conforms to international standards. The programme corresponds to Qualification Level 2 of the Bologna Programme and to Qualification Level 7 of the "European Qualifications Framework for Lifelong Learning" developed by the European Union. Table 5 provides an overview.

Table 5: Formal aspects

Duration and Workload	4 semesters, 120 ECTS credits
Language	English
Credits	Courses are assigned a certain number of hours in class and a number of hours for individual coursework; the sum of both yields the actual workload. 30 work hours are equivalent to 1 ECTS credit point. 30 ECTS credit points correspond to the average coursework of a semester at the University of Liechtenstein.
Academic Degree	Master of Science in Information Systems
Official Abbreviation	MSc
Admission Requirements	Admission requirements are specified in the Admission Guidelines for the Master's degree programme in Information Systems.
Further Educational Options	The degree grants eligibility for a doctoral degree programme.

3. Module structure

Table 6 provides an overview of all modules.

Table 6: Module structure³

Semester	Module Course(s) within the module	Type	Class hours/week (in units of 45 minutes)	ECTS
1	Management Information Systems	CO		9
	Management Information Systems LE	LE	4	6
	Management Information Systems SE	SE	2	3
	Process & Data Management	CO		3
	Process & Data Management LE	LE	2	3
	Cyber Security⁴	CO		3
	Cyber Security LE	LE	2.5	3
	Research Methods	CO		6
	Research Methods LE	LE	2.5	6
	Business Statistics I	CO		3
	Business Statistics I LE	LE	2	3
	Innovation Lab I	CO		3
Innovation Lab I SE	SE	2	3	
2	Systems Analysis & Design	CO		6
	Systems Analysis & Design LE	LE	3	6
	Supply Chain Management	CO		6
	Supply Chain Management LE	LE	3	6
	Leadership & Management	CO		6
	Leadership & Management SE	SE	3.5	6
	Business Statistics II	CO		3
	Business Statistics II LE	LE	2	3
	Innovation Lab II	CO		3
Innovation Lab II SE	SE	2	3	
3 (BPM specialisation)	Process Analysis	OC		9
	Process Analysis LE	LE	6	9
	Process Implementation	OC		6
	Process Implementation LE	LE	4	6
	Process Management	OC		6
	Process Management LE	LE	4	6
	Project Seminar BPM	OC		6
	Project Seminar BPM	SE	4	6
	Research Seminar BPM	OC		3
	Research Seminar BPM	SE	2	3
3 (Data Sci-	Data Management	OC		6

³ CO = Compulsory; E = Elective; LE = Lecture; OC = Optional Compulsory; SE = Seminar

⁴ Amended by Senate resolution on May 2, 2018

ence special- isation)	Data Management LE	LE	4	6
	Business Intelligence	OC		6
	Business Intelligence SE	SE	4	6
	Data Mining & Predictive Analytics	OC		6
	Data Mining & Predictive Analytics LE	LE	4	6
	Decision Theory	OC		3
	Decision Theory LE	LE	2	3
	Project Seminar Data Science	OC		6
	Project Seminar Data Science	SE	4	6
	Research Seminar Data Science	OC		3
Research Seminar Data Science	SE	2	3	
4	Master's Thesis	CO	1	27
1-4	Cross-Faculty Elective Modules	OC		12

4. Module handbook

The current module descriptions are accessible via the university intranet.