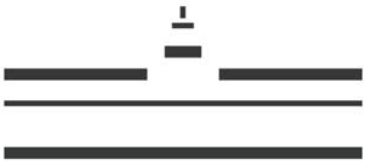

Westfälische
Wilhelms-Universität
Münster

Module Descriptions

Master of Science in Information Systems (PO 2010)
School of Business and Economics
University of Münster

October 2014

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WWU Münster

Contents

1 Overview: Course structure, valid from October 2014

	Track		Winter Term (WT)		Summer Term (ST)	
Method Tracks	IM	Information Management	IM1: MIAO Managing the Information Age Organization	IM2: IMTT IM Tasks and Techniques	IM3: IMTh IM Theories	
	PM	Process Management	PM1: InfMod Information Modeling		PM2: EAM Enterprise Architecture Management	PM3: WfM Workflow Management
	BN	Business Networks	BN1: IOS Interorganizational Systems		BN2: ITSec Information Security	BN3: NetEcon Network Economics
	BI	Business Intelligence	BI1: MISDWH Management Information Systems and Data Warehousing	BI2: DA1 Data Analytics 1	BI3: DA2 Data Analytics 2	
	ISD	Information Systems Development	ISD1: LSLPP Logic Specification and Logic Programming	ISD2: DInt Data Integration	ISD3: ACSE Advanced Concepts in Software Engineering	
Domain Tracks	LPR	Logistics, Production and Retail	LPR1: SCM Supply Chain Management and Logistics	LPR2: PPC Production Planning and Control	LPR3: Ret Retail	
Every term		EM: Seven Elective Modules (6CP), consisting of: at least two seminars , at most five L/E-modules, taken from modules not chosen above or from Master Studies in Computer Science or in Business Administration				
		PS: Project Seminar (12 CP)				
		MT: Master's Thesis module (30 CP)				

- Two Tracks have to be studied. Every Track-Module consists of a 6CP-Lecture with Excercises.

2 Module Descriptions

Preliminary Remarks to Module Descriptions:

- Nr. 8 (Relevant work): The actual duration of written examinations is published in time by the examination board.
- Nr. 12 (Module prerequisites): For the Seminar Module (EMSem) and the Project Seminar Module (PS), the content of the seminar might depend on certain modules. Furthermore, seminars and project seminars are restricted in size and, hence, are subject to a centralized distribution procedure. Seminars and project seminars are introduced at the end of the preceding term. An application for seminars and project seminars is necessary. Introduction of topics and application details will be regularly announced in the coordinators Blog.

Module Title:	Information Management: Managing the Information Age Organization				
Course Program	Master of Science in Information Systems				
1	**Module No:** IM1	**State:** compulsory in track IM; optional as elective	**Language of Instruction:** English		
2	**Turn:** every winter term	**Duration:** 1 term	**Semester:** 1-2	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Lecture		30 (2 CH)	90
2	E	Exercise		30 (2 CH)	30

4 **Contents:**

Background: The lecture *Managing the Information Age Organization* assumes that students have a basic understanding of Business Administration, Management Studies, and business applications of information technology as conveyed in Bachelor Programs in IS and related fields.

Main topics and learning objectives: The lecture provides students with a sound understanding of management and management theories as well as with the foundations of the information society. On the basis of this understanding, students are confronted with management challenges prevalent in the information age. While doing this, special emphasis is laid on how information technology affects the capabilities of an organization to compete in the information economy.

Teaching is conducted through traditional lectures complemented with case study work and discussions in the classroom. Additional reading material is provided in order to allow students to review parts of the content at their leisure and to extend their knowledge in areas of personal interest.

5 **Learning outcomes:**

Academic: After attending the course students should be familiar with the foundations of management, i.e. (strategic) planning, controlling, organization, and leadership. They should understand the specific conditions organizations are exposed to in the "Information Age" and be able to explain the technological, social and economic phenomena constituting it. Furthermore, they are expected to have an idea of how the information age challenges traditional management concepts and what appropriate responses to these challenges might look like.

Soft skills: The course introduces students to the analysis of case studies in small groups and furthers their ability to actively participate in classroom discussions.

6 **Description of possible electives within the modules:** None

7 **Examination:**

[X] Final Module Exam [ ] Examinations for every part of the module

8 **Relevant Work:**

Number and Type; Connection to Course	Duration	Part of final mark in %
Written Exam	Up to 120 min	100

9 **Study work:**

Number and Type; Connection to Course	Duration
None	

10 **Prerequisites for Credit Points:**

The credit points will be granted after all relevant work and study work have been successfully completed.

11 **Weight of the module grade for the overall grade:**

5% (6 of 120 CP)

12 **Module Prerequisites:** None

13 **Presence:** Presence is recommended.

14 **Use of the module for other course programs:** As an elective part of the Minor IS offered within the course program "Master of Science in Business Administration"

15	**Responsible Lecturer** Prof. Dr. Stefan Klein	**Department:** Münster School of Business and Economics

16 **Misc.:**

Module Title:	Information Management: Tasks and Techniques	
Course Program	Master of Science in Information Systems	

1	**Module No:** IM2	**State:** compulsory in track IM; optional as elective

2	**Turn:** every winter term	**Duration:** 1 term	**Semester:** 1-2	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Lecture		30 (2 CH)	90
2	E	Exercise		30 (2 CH)	30

4 **Contents:**

Background: The course requires a sound understanding of both management studies and information processing in business. This course interlinks with the course "Managing the Information Age Organization", which deepens the students' understanding of management basics that this course builds upon. In order to provide students from a non IS-background with the managerial understanding of information processing necessary for participating successfully in this course, an extensive script on this subject is provided at the beginning of the semester.

Main topics and learning objectives: The lecture provides students with an overview of executives' duties in managing an organization's information and communication capabilities. These duties include tasks such as strategic information planning, strategy implementation, as well as sourcing and organizing the information function. These tasks are structured in a comprehensive framework based on management theory. While identifying critical IM tasks and responsibilities, the course presents methods and techniques that can be applied to deal with them. Class discussions on case studies give students the opportunity to consolidate their newly acquired knowledge and apply the techniques presented to typical problems. In addition, occasional discussions with IT executives allow students to reflect their conceptual knowledge in light of real world practices.

5 **Learning outcomes:**

Academic: The course provides students with skills indispensable for an IT executive. In particular, students will obtain a comprehensive overview of the field of IT management and get acquainted with the typical tasks IT managers are charged with. They will also get to know prominent frameworks and techniques to solve IM tasks as proposed in textbooks.

Soft skills: In addition to expertise in the fields mentioned above, students will deepen their skills in constructively analyzing and solving case studies in both classroom settings and as part of individual assignments.

6 **Description of possible electives within the modules:** None

7 **Examination:**

[X] Final Module Exam [ ] Examinations for every part of the module

8 **Relevant Work:**

Number and Type; Connection to Course	Duration	Part of final mark in %
Written Exam	Up to 120 min	100

9 **Study work:**

Number and Type; Connection to Course	Duration
None	

10 **Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.

11 **Weight of the module grade for the overall grade:** 5% (6 of 120 CP)

12 **Module Prerequisites:** None

13 **Presence:** Presence is recommended.

14 **Use of the module for other course programs:** As an elective part of the Minor IS offered within the course program "Master of Science in Business Administration"

15 **Responsible Lecturer** Prof. Dr. Stefan Klein **Department:** Münster School of Business and Economics

16 **Misc.:**

Module Title:	Information Management: Theories
Course Program	Master of Science in Information Systems

1	**Module No:** IM3	**State:** compulsory in track IM; optional as elective	**Language of Instruction:** English

2	**Turn:** every summer term	**Duration:** 1 term	**Semester:** 1-2	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Class Discussion		30 (2 CH)	60
2	E	Presentation, preparation of discussion		30 (2 CH)	60

4 **Contents:** *Background*: A sound understanding of management and information management as provided in the courses "Managing the Information Age Organization" and "Information Management Tasks & Techniques".
Main topics and learning objectives: This course deepens the students' understanding of IM tasks and techniques in that it enables them to assess underlying theoretical propositions in more detail. To this end, the lecture introduces important management theories, including market, resource and capability based theories of strategic information systems, IT strategy theory, IT value and productivity theory, organization theory of IT and theories of sourcing and governing the information function. Moreover, on the basis of this theoretical knowledge, critical issues of IM are discussed in the light of the controversial academic discussions surrounding them.
The course builds on well-prepared class discussions rather than traditional lectures. The lecturer will support learning by carefully selecting papers and placing them into a broader "theoretical landscape". He will moderate and facilitate the discussions, and provide feedback on the assignments during the semester (reading papers, preparing presentations, writing minutes).

5 **Learning Outcomes:** *Academic:* The overall aim of this course is to give students access to the academic debate on IM. More specifically, the course is intended to introduce students to the international academic debate on the most important or discussed issues of information management. The students will gain insight into the theories underlying the frameworks and techniques proposed for solving IM tasks and will be able to assess these tools and the underlying theories critically.
Soft skills: In addition to providing students with the capabilities to deal with academic literature reflectively, the course helps to further the students' ability to take an active part in academic discussions. This ability is based on a combination of reading, thinking, writing, discussing and listening skills.

6 **Description of possible electives within the modules:** None

7 **Examination:**
[X] Final Module Exam [ ] Examinations for every part of the module

8 **Relevant Work:**

Number and Type; Connection to Course	Duration	Part of final mark in %
Written Exam	Up to 120 min	60
1 Presentation (groups of 3-4 students - 15%) 1 written report (10%) 12 written comments on weekly reading (15%)	ca. 20min ca 3 pages ca. 1 page per comment	40

9 **Study work:**

Number and Type; Connection to Course	Duration
None	

10 **Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.

11 **Weight of the module grade for the overall grade:** 5% (6 of 120 CP)

12 **Module Prerequisites:** None

13 **Presence:** Presence is recommended.

14 **Use of the module for other course programs:** As an elective part of the Minor IS offered within the course program "Master of Science in Business Administration"

15 **Responsible Lecturer** Prof. Dr. Stefan Klein **Department:** Münster School of Business and Economics

16 **Misc.:**

Module Title:	Process Management: Information Modeling
Course Program	Master of Science in Information Systems

1	**Module No:** PM1	**State:** compulsory in track PM; optional as elective	**Language of Instruction:** English

2	**Turn:** Every winter term	**Duration:** 1 term	**Semester:** 1-2	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Lecture		30 (2 CH)	60
2	E	Exercise		30 (2 CH)	60

4 **Contents:**

Background and relations to other courses: The lecture is on one of the core topic areas in Information Systems: Conceptual Modeling (i.e., process modeling, data modeling, organizational modeling etc.) with a focus on the use and reuse of conceptual models in business. Hence, the focus is not on how to create a conceptual model, but on what are the preconditions of models to really be usable in practice and on approaches and methodologies supporting model use and reuse, especially model analysis. The lecture therefore provides a theoretical basis for courses applying modeling techniques, such as PM2, PM3, BI1, ISD1, ISD2, ISD3, PR1, PR2, and PR3.

Main topics and learning objectives:

Themes	Learning objectives
Meta modeling / meta meta modeling / meta modeling tools	To be able to design modeling languages with meta models, and to be able to design modeling tools and meta modeling tools with meta model and meta meta model-based databases.
Modeling frameworks	To be able to provide an overview of modeling frameworks, to be able to evaluate and compare them, and to be able to apply selected parts of them.
Model variant management	To be able to apply selected approaches on model variant management onto models of different modeling languages.
Model disambiguation	To know why unambiguous models are a precondition for actually using them for business purposes, and to apply selected methodologies on model disambiguation.
Model analysis	To know different areas of model analysis, for instance process improvement, process compliance, model transformation, model comparison, model integration, or business activity monitoring, and to be able to apply selected approaches on model analysis. The focus is on pattern-based model querying.
Domain-specific modeling	To explain domain-specific modeling and to be able to argue both in favor and against the usage of such modeling approaches.

5 **Learning outcomes:**

Academic: Impart a broad and profound understanding of the main tasks and challenges of conceptual modeling. Facilitate understanding of different modeling and model analysis approaches and judge their appropriateness for specific contexts of application.

Soft skills: The ability to organize small working groups independently and to give presentations in front of a large audience.

6 **Description of possible electives within the modules:** None

7 **Examination:**
[X] Final Module Exam [ ] Examinations for every part of the module

8 **Relevant Work:**

Number and Type; Connection to Course	Duration	Part of final mark in %
Written exam	Up to 120 Min.	90
10 case studies, 4 presentations	Ca 4-8 pages/case study, ca 20 Min./presentation	10

9 **Study work:**

Number and Type; Connection to Course	Duration
None	

10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.	
11	**Weight of the module grade for the overall grade:** 5% (6 of 120 CP)	
12	**Module Prerequisites:** None	
13	**Presence:** Presence is recommended.	
14	**Use of the module for other course programs:** As an elective part of the Minor IS offered within the course program "Master of Science in Business Administration"	
15	**Responsible Lecturer:** PD Dr. Patrick Delfmann	**Department:**Münster School of Business and Economics
16	**Misc.:**	

Module Title:		Information Management: Enterprise Architecture Management			
Course Program		Master of Science in Information Systems			
1	**Module No:** PM2	**State:** compulsory in track PM; optional as elective		**Language of Instruction:** English	
2	**Turn:** every summer term	**Duration:** 1 term	**Semester:** 1-2	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Lecture		30 (2 CH)	60
2	E	Exercise		30 (2 CH)	60

4

Contents: This course provides insights into the concepts and methods of Enterprise Architecture Management. The need for architectures in complex organizations as an instrument for transformation is motivated by the challenges enterprises face in today's business. Architectures support the effective planning and governance of enterprises as a whole consisting of business and IT. Consistently implemented, they facilitate the understanding of business entities' interrelationships, set them in relation to strategic goals and help define the desired to-be state and the roadmap for its realization. For this purpose, concepts, methods, models and tools are discussed and enriched with insights from practice. The introduction of a specialized modeling language introduces the students to the creation of architectural artifacts. The concrete architecture realization process is underlined by the study of architecture frameworks currently discussed in research and practice.

Background and relations to other courses: This course stresses the aspect of IM as an engineering discipline, in contrast to being a management discipline only. The fundamental idea is to describe organizations as a whole, consisting of goals and strategies, business models, processes, people and information technology. Enterprise Architecture Management propagates a holistic approach that primarily aims at aligning the spheres of business and IT within one or across several companies and at facilitating and governing transformation processes. The Information Manager thereby has the role of an architect of the corporate information infrastructure.
The Module "Managing IT in the Information Age" introduces students to the tasks and tools in Information Management thus setting the scene for this Module.

Main topics and learning objectives:

Themes	Learning objectives
Motivation of Enterprise Architecture Management	To learn about the challenges today's enterprises are facing and the answers Enterprise Architecture Management provides in this context.
Positioning Enterprise Architecture Management	To learn the definition and major concepts of Enterprise Architecture Management, about its key applications and its role as a bridge from strategy to design.
Management areas and best practices	To learn about the management areas relevant to Enterprise Architecture Management and associated best practices commonly applied.
Modeling of Enterprise Architectures	To learn how to create different architectural artifacts and to connect them to create a holistic, purposeful picture of the enterprise. Moreover, to learn to use viewpoints to generate stakeholder-specific views of the architecture.
Frameworks in Enterprise Architecture Management	To learn why frameworks play an important role in Enterprise Architecture Management and to get to know prominent frameworks that are vividly discussed in research and practice.

5

Learning outcomes:

Academic: The students' ability to develop and manage Enterprise Architectures is the course's major goal. An understanding of current developments and frameworks in the domain of architecture implementation should be obtained. Students are equipped with methods for planning, creating and governing such architectures. Furthermore, practical skills in architecture development will be conveyed with work on case studies and presentation of the results.

Soft skills: Students are encouraged to prepare the contents of the lecture and exercises and to perform follow-up work in teams. This is supported by a Learnweb discussion forum that is guided by the chair. The case study is organized as group work and thus promotes the students' ability to cooperate in teams and to manage their time efficiently. The intermediary results are presented regularly by the groups in front of the complete audience. This enhances the students' presentation and discussion skills. The creation of architectural models by using a syntactically and semantically defined modeling language sharpens analytical and logic skills.

6 **Description of possible electives within the modules:** None

7	**Examination:** [X] Final Module Exam [ ] Examinations for every part of the module		
8	**Relevant Work:** **Number and Type; Connection to Course**	**Duration**	**Part of final mark in %**
	Written Exam	Up to 120 min.	60
	Case Study with EAM-Software, Presentation	Ca 40 pages documentation, ca 40 minutes presentation	40
9	**Study work:** **Number and Type; Connection to Course**	**Duration**	
	None		
10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.		
11	**Weight of the module grade for the overall grade:** 5% (6 of 120 CP)		
12	**Module Prerequisites:** None		
13	**Presence:** Presence is recommended.		
14	**Use of the module for other course programs:** As an elective part of the Minor IS offered within the course program "Master of Science in Business Administration"		
15	**Responsible Lecturer:** Prof. Dr.-Ing. Bernd Hellingrath	**Department:** Münster School of Business and Economics	
16	**Misc.:**		

Module Title:	Process Management: Workflow Management				
Course Program	Master of Science in Information Systems				
1	**Module No:** PM3	**State:** compulsory in track PM; optional as elective			**Language of Instruction:** English
2	**Turn:** Every summer term	**Duration:** 1 term	**Semester:** 1-2	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Lecture		30 (2 CH)	30
2	E	Exercise		30 (2 CH)	90

4 **Contents:**

Background and relations to other courses: This course links the business view on organizational business processes with the technical implementation of these. It therefore provides means for implementing business requirements in an organizational environment, as task related to topics in PM1, PM2, ISD1, ISD2, ISD3, PR1, and PR3.

Main topics and learning objectives:

Themes	Learning objectives
(1) Basics of Workflow Management	To be able to provide an overview of the entire process of workflow implementation and to explain its relevance
(2) Conceptual workflow definition	To be able to understand and create workflow definitions.
(3) Technical workflow implementation	To be able to understand and create workflow implementations, and to explain the relations between (2) and (3)
(4) Workflow Management Systems	To be able to actually implement workflows with Workflow Management Systems used in practice.

5 **Learning outcomes:**

Academic: The ability to manage business process redesign projects in organizations, an understanding of the challenges faced in the course of such a project, and techniques to cope with them.

Soft skills: The ability to organize small working groups independently and to give presentations in front of a large audience.

6 **Description of possible electives within the modules:** None

7 **Examination:**
[X] Final Module Exam [ ] Examinations for every part of the module

8 **Relevant Work:**

Number and Type; Connection to Course	Duration	Part of final mark in %
Written exam	Up to 120 min	60
Four presentations of an accompanying case study	Ca 20+20+20+30 Min.	40

9 **Study work:**

Number and Type; Connection to Course	Duration
None	

10 **Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.

11 **Weight of the module grade for the overall grade:** 5% (6 of 120 CP)

12 **Module Prerequisites:** None

13 **Presence:** Presence is recommended.

14 **Use of the module for other course programs:** As an elective part of the Minor IS offered within the course program "Master of Science in Business Administration"

15	**Responsible Lecturer:** PD Dr. Patrick Delfmann, Dr. Armin Stein	**Department:** Münster School of Business and Economics

16 **Misc.:**

Module Title:	Business Networks: Interorganizational Systems				
Course Program	Master of Science in Information Systems				
1	**Module No:** BN1	**State:** compulsory in track BN; optional as elective	**Language of Instruction:** English		
2	**Turn:** every winter term	**Duration:** 1 term	**Semester:** 1-2	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Lecture	3	30 (2 CH)	45
2	E	Exercise	3	30 (2 CH)	75

4 **Contents:** Networks have become ubiquitous forms of organizing in and between economy, public administration and society at large. On the backdrop of this development this module introduces interorganizational systems and networks in a business context, yet with linkages to public administration (e.g. customs) and social networks. It aims to explore the contingencies and strategies that lie behind the evolution and use of interorganizational information infrastructures and applications (IOS). Further, students will examine the impact of IOS on distributed forms of value generation such as electronic markets and various types of networks.
Drawing on case examples as well as theoretical concepts, a life cycle perspective of IOS management will be introduced. The implications of IOS will be discussed from various perspectives such as industry transformation, intermediation, strategic management, organization, information management and IS development. This discussion will be informed by theories addressing networking issues such as institutional economics, collective action or organization theory.

5 **Learning Goals:** *Academic:* The course will provide students with analytical skills enabling them to explain the emergence of networks. Students should be able to both identify specific network management tasks (networkability) and apply prominent theories and frameworks to explain the impact of IOS.
Soft skills: In addition to providing students with the capabilities to deal with academic concepts and literature reflectively, the course helps to further the students' ability to take an active part in discussions. This ability is based on a combination of reading, thinking, writing, discussing and listening skills.
Moreover, students will develop skills in applying these techniques to practical problems, e.g. through problem based learning exercises. Course assignments will be organized as group work, so that students can practice their collaboration skills and learn techniques for efficient collaboration.

6 **Description of possible electives within the modules:** None

7 **Examination:**
[X] Final Module Exam [ ] Examinations for every part of the module

8 **Relevant Work:**

Number and Type; Connection to Course	Duration	Part of final mark in %
Written Exam	Up to 120 min	50
Group Presentation (ca 3-5 students, 10%), 2 written elaborations (20% each)	Ca 15 Min./ each ca 5 pages	50

9 **Study work:**

Number and Type; Connection to Course	Duration
None	

10 **Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.

11 **Weight of the module grade for the overall grade:** 5% (6 of 120 CP)

12 **Module Prerequisites:** None

13 **Presence:** Presence is recommended.

14 **Use of the module for other course programs:** As an elective part of the Minor IS offered within the course program "Master of Science in Business Administration"

15 **Responsible Lecturer:** Prof. Dr. Stefan Klein **Department:** Münster School of Business and Economics

16 **Misc.:**

Module Title:		Business Networks: Information Security				
Course Program		Master of Science in Information Systems				
1	**Module No:** BN2	**State:** compulsory in track BN; optional as elective				
2	**Turn:** Summer	**Duration:** 1 term	**Semester:** 1-2	**CP:** 6	**Workload (h):** 180	

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Information Security		30 (2)	60
2	E	Information Security		30 (2)	60

4

Contents: This lecture covers the foundations of information security including the specification of protection goals, adversary models, security mechanisms (e.g., identification, access control) and cryptographic primitives to enforce protection goals in distributed systems (e.g., symmetric and asymmetric encryption, integrity protection). Security mechanisms will be discussed both from the perspective of a system operator, who protects a larger distributed system, as well as from the end users' point of view, who may wish to use security technology to self-protect against untrustworthy system operators.

Background and relations to other courses: None

Main topics and learning objectives:

Themes	Learning objectives
Lecture: Theoretical Security, Practical Security, Security Strategy, Privacy Exercise: Primer on Information Theory, Primer on Coding Theory, Primer on Number Theory, Primer on Computational Complexity, Block Cipher Operating Modes, exercises accompanying the lecture	This course contributes to ensure that every graduate who potentially makes decisions with security impact has sufficient knowledge to a) identify security issues, b) communicate effectively with security experts, c) keep aware of changing technological limits, d) evaluate security advises critically and comprehensively, e) oversee the implementation of security measures, and f) assume responsibility for their effects and potential side-effects.

5 **Learning outcomes:**

Academic: See objectives a), c), d), e)

Soft skills: See objectives b) and f)

6 **Description of possible electives within the modules:** None

7 **Examination:**

[X] Final Module Exam [ ] Examinations for every part of the module

8 **Relevant Work:**

Number and Type; Connection to Course	Duration	Part of final mark in %
Oral examination	Ca 20 Min.	80
One written exercise	Ca 10 pages	20

9 **Study work:**

Number and Type; Connection to Course	Duration
None	

10 **Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed..

11 **Weight of the module grade for the overall grade:** 5% (6 of 120 CP)

12 **Module Prerequisites:** None

13 **Presence:** Presence is recommended.

14 **Use of the module for other course programs:** As an elective part of the Minor IS offered within the course program "Master of Science in Business Administration"

15 **Responsible Lecturer:** Prof. Dr. Rainer Böhme **Department:** Münster School of Business and Economics

16 **Misc.:**

Module Title:		**Business Networks: Network Economics**				
Course Program		**Master of Science in Information Systems**				
1	**Module No:** BN3	**State:** compulsory in track BN; optional as elective				
2	**Turn:** Summer	**Duration:** 1 term	**Semester:** 1-2	**CP:** 6	**Workload (h):** 180	

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L			30 (2)	60
2	E			30 (2)	60

4

Contents: This course blends an introduction to network economics with selected topics in computer networking. It teaches technical and formal economics skills in a unique combination tailored to students of Information Systems. Emphasis is put on simple models lending themselves to rigorous solutions. Participants immerse in the notion that network graphs form the social and economic fabric of an information society, and grasp the emergent properties of design choices in the Internet technology. They learn by many practical examples to appreciate the power of networks as well as ways to control it. Successful graduates are equipped with essential skills that qualify them for assuming responsibility in strategy teams of network industries (including startups), policy-making bodies, or research institutions.

Background and relations to other courses: There is intentional overlap with the module BN Interorganizational Systems, which complements this course by taking a qualitative-holistic approach to questions in the scope of network economics.

Main topics and learning objectives:

Themes	Learning objectives
History and foundations of network economics, agents, incentives, externalities, information regimes; network topologies, random graphs, degree distributions; non-cooperative network games, congestion, risk propagation; network formation, dynamics, standards, adoption; network management and regulation, pricing, strategic partnerships, competition; analysis tools, including primers on game and graph theory, computational aspects, approximation, software tools, simulation, visualization; Internet protocols as practical examples	a) Students learn to "think in networks". They get a deep understanding of the role of network topology as a distinctive factor that defines the properties of complex social and technical systems. They get used to the ideas of emergence, feedback loops and equilibria. b) They dispose of models to describe as well as analytical tools to analyze and explain phenomena arising in networks. c) They can apply their knowledge in unprecedented ways to study new real-world problems with the lens of network economics. This enables them to d) contribute to theoretical and empirical research as well as to e) create and shape practical socio-technical systems based on well-founded principles. f) Awareness of the limitations of formal models, taught by examples of failure, prevents blind reliance and encourages responsible action.

5 **Learning outcomes:**

Academic: See objectives b), d), e)

Soft skills: See objectives a), c), f)

6 **Description of possible electives within the modules:** None

7 **Examination:**

[X] Final Module Exam [ ] Examinations for every part of the module

8 **Relevant Work:**

Number and Type; Connection to Course	Duration	Part of final mark in %
Written Examination	Up to 120 min.	100

9 **Study work:**

Number and Type; Connection to Course	Duration
None	

10 **Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.

11 **Weight of the module grade for the overall grade:** 5% (6 of 120 CP)

12 **Module Prerequisites:** None

13	**Presence:** Presence is recommended.	
14	**Use of the module for other course programs:** As an elective part of the Minor IS offered within the course program "Master of Science in Business Administration"	
15	**Responsible Lecturer:** Prof. Dr. Rainer Böhme	**Department:** Münster School of Business and Economics
16	**Misc.:**	

Module Title:	Business Intelligence: Management Information Systems and Data Warehousing				
Course Program	Master of Science in Information Systems				
1	**Module No:** BI1	**State:** compulsory in track BI; optional as elective	**Language of Instruction:** English		
2	**Turn:** Every winter term	**Duration:** 1 term	**Semester:** 1-2	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Lecture		30 (2 CH)	60
2	E	Exercise, Case Study, Presentations		30 (2 CH)	60

4 **Contents:**

Background and relations to other courses: Business Intelligence (BI) refers to a variety of methods and techniques for the analysis of business data such as data warehousing (DWH), reporting, Online Analytical Processing (OLAP), and data mining. This course addresses the methodical design and implementation of data warehouse systems in support of management's decision making, particularly via appropriate use of multidimensional schema design, ETL, and OLAP techniques. All relevant concepts are demonstrated from both a theoretical and a practical perspective. In this course, traditional lectures are complemented by student presentations that provide additional content. In addition, exercises and case studies provide ample opportunities to perform the various development phases in realistic and practical settings.

Main topics and learning objectives: Students will be able to explain the problems, issues, solutions, techniques, tools, and applications relating to BI and DWH. They will be able not only to design and implement ETL processes and OLAP solutions but also to discuss differences among OLAP design approaches and to evaluate the quality of multidimensional schemata.

Themes	Learning objectives
Data Warehousing Fundamentals	To define architectures and use cases of data warehousing and management information systems and to assess their roles for companies
OLAP Processing and Optimization	To compare differences between OLTP and OLAP; to contrast OLAP workloads and demonstrate appropriate OLAP optimization techniques
ETL Design	To compare different ETL processes and tools; to design simple ETL processes
OLAP Modeling	To describe the role of functional dependencies for the identification of multidimensional structures; to design multidimensional structures
OLAP Modeling Approaches	To assess different OLAP modeling approaches; to demonstrate conceptual modeling of scenarios according to an appropriate approach
OLAP Implementation	To describe the architecture and functionality of OLAP systems; to implement reports with a standard BI platform according to a case study
Modern Architectures	To characterize modern architectures addressing hardware trends (multi/many core, in-memory),novel data requirements (big data, streaming data), and increased user expectations (situational BI)
Project Management	To compare different approaches to engage in an MIS/DWH project; to evaluate different BI strategies in organizations and understand their implementation.

5 **Learning outcomes:**

Academic: To understand and to be able to apply the addressed topics

Soft skills: To manage and to organize group work regarding given tasks and presentations

6 **Description of possible electives within the modules:** None

7 **Examination:**

[X] Final Module Exam [ ] Examinations for every part of the module

8 **Relevant Work:**

Number and Type; Connection to Course	Duration	Part of final mark in %
Written Exam	Up to 120 Min.	60
4 Exercises, case study with presentation	Exercises and case study: ca 10 pages per exercise and case study; presentation: ca 20 Min.	40

9 **Study work:**

Number and Type; Connection to Course	Duration
None	

10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.	
11	**Weight of the module grade for the overall grade:** 5% (6 of 120 CP)	
12	**Module Prerequisites:** None	
13	**Presence:** Presence is recommended.	
14	**Use of the module for other course programs:** As an elective part of the Minor IS offered within the course program "Master of Science in Business Administration"	
15	**Responsible Lecturer:** Prof. Dr. Dr. h. c. Jörg Becker, Prof. Dr. Gottfried Vossen	**Department:** Münster School of Business and Economics
16	**Misc.:**	

Module Title:	Business Intelligence: Data Analytics - I				
Course Program	Master of Science in Information Systems				
1	**Module No:** BI2	**State:** compulsory in track BI; optional as elective			**Language of Instruction:** English
2	**Turn:** Winter	**Duration:** 1 term	**Semester:** 1-2	**CP:** 6	**Workload (h): 180**

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Lecture "Data Analytics - I"		30 (2 CH)	60
2	E	Exercise		30 (2 CH)	60

4 **Contents:**

Background and relations to other courses: The track "Business Intelligence" ideally complemented by electives from marketing and by a seminar, offers a way to start a career in database management and the like. The students are supposed to be familiar with the basic concepts from probability theory and statistics.

Main topics and learning objectives: The lecture focusses on multivariate statistical methods in the context of data mining. The main topic is unsupervised learning. Practical exercises using the statistical Software R are integrated into the lecture and a tutorial.

Themes	Learning objectives
Data Preprocessing:	Data quality a-priori to quantitative analysis, i.e. outlier detection, checks for multivariate normality
Unsupervised Learning:	Clustering, Principal Components, Multidimensional Scaling

5 **Learning outcomes:**

Academic: The student is supposed to have an understanding of state of the art techniques in multivariate data analysis as well as the ability to choose and implement an appropriate technique for a given practical task.

Soft skills: Team work, presentation techniques

6 **Description of possible electives within the modules:**
None

7 **Examination:**
[X] Final Module Exam [ ] Examinations for every part of the module

8 **Relevant Work:**

Number and Type; Connection to Course	Duration	Part of final mark in %
Written Exam	Up to 120 min.	60%
Case study with R software, presentation	Report: ca 15 pages, presentation: ca 40 Min.	40%

9 **Study work:**

Number and Type; Connection to Course	Duration
None	

10 **Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.

11 **Weight of the module grade for the overall grade:** 5% (6 of 120 CP)

12 **Module Prerequisites:** None

13 **Presence:** Presence is recommended.

14 **Use of the module for other course programs:** As an elective part of the Minor IS offered within the course program "Master of Science in Business Administration"

15	**Responsible Lecturer:** Prof. Dr. Heike Trautmann	**Department:** Münster School of Business and Economics

16 **Misc.:**

Module Title:	Business Intelligence: Data Analytics - II					
Course Program	Master of Science in Information Systems					
1	**Module No:** BI3	**State:** compulsory in track BI; optional as elective			**Language of Instruction:** English	
2	**Turn:** Every summer term	**Duration:** 1 term	**Semester:** 1-2	**CP:** 6	**Workload (h):** 180	

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Lecture "Data Analytics - II"		30 (2 CH)	60
2	E	Exercise		30 (2 CH)	60

4 **Contents:**

Background and relations to other courses: The track "Business Intelligence" ideally complemented by electives from marketing and by a seminar, offers a way to start a career in database management and the like. The students are supposed to be familiar with the basic concepts from probability theory and statistics.

Main topics and learning objectives: The lecture focusses on multivariate statistical methods in the context of data mining. The main topic is supervised learning. Practical exercises using the statistical Software R are integrated into the lecture and a tutorial.

Themes	Learning objectives
Data Preprocessing:	Data quality a-priori to quantitative analysis, specifically treatment of missing values
Supervised Learning:	Selected regression and classification approaches

5 **Learning outcomes:**

Academic: The student is supposed to have an understanding of state of the art techniques in multivariate data analysis as well as the ability to choose and implement an appropriate technique for a given practical task.

Soft skills: Team work, presentation techniques

6 **Description of possible electives within the modules:** None

7 **Examination:**
[X] Final Module Exam [ ] Examinations for every part of the module

8 **Relevant Work:**

Number and Type; Connection to Course	Duration	Part of final mark in %
Written Exam	Up to 120 min.	60%
Case study with R software, presentation	Ca 40 Min. (presentation), ca 15 pages (report)	40%

9 **Study work:**

Number and Type; Connection to Course	Duration
None	

10 **Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.

11 **Weight of the module grade for the overall grade:** 5% (6 of 120 CP)

12 **Module Prerequisites:** None

13 **Presence:** Presence is recommended.

14 **Use of the module for other course programs:** As an elective part of the Minor IS offered within the course program "Master of Science in Business Administration"

15 **Responsible Lecturer:** Prof. Dr. Heike Trautmann | **Department:** Münster School of Business and Economics

16 **Misc.:**

Module Title:	Information Systems Development: Logic Specification and Programming				
Course Program	Master of Science in Information Systems				
1	**Module No:** ISD1	**State:** compulsory in track ISD; optional as elective	**Language of Instruction:** English		
2	**Turn:** every winter term	**Duration:** 1 term	**Semester:** 1-2	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Lecture		30 (2 CH)	45
2	E	Exercise		30 (2CH)	75

4 **Contents:**

Background and relations to other courses: It is assumed that the students have some experience with programming and software development as taught in the bachelor program.
Depending on the subject of the intended master thesis, the taught material can be helpful.

Main topics and learning objectives: The course consists of lectures providing the theoretical background and of accompanying biweekly exercises.

Themes	Learning objectives
Logics	Expressing the relationships between real-world entities in logic. Knowing how to transform a logic specification into an executable Prolog program.
Prolog	Knowing the features of the logic programming language Prolog, such as Horn-rules, unification, SLD-resolution, backtracking, negation, and cut. Being able to program in Prolog.
Constraint Solving	Expressing real-world relationships as constraints over a suitable domain. Knowing how to solve such constraints using a constraint solver from Prolog.
Business Rules Management Systems	Knowing how to express volatile business logic by rules. Including these rules into a business rules management system (BRMS) such as Drools. Knowing how the BRMS evaluates the rules. Integrating a BRMS into an information system.
Temporal Logics and Model Checking	Expressing temporal relationships by temporal logics such as CTL and LTL. Knowing how to automatically check information systems for compliance with a temporal specification. Being able to apply a model checker such as Java PathFinder to guarantee the correctness of e.g. Java programs.
Datalog and Deductive Databases	Knowing the syntax and semantics of the logic programming language Datalog. Being able to query deductive databases.

5 **Learning outcomes:**

Academic:
The students learn to specify complex real-world relationships using logic and to transform such a specification into an executable logic program possibly including constraints or to handle it using model checking.

Soft skills:
The exercises are solved in teams of 3-5 students. Hence, the students get some experience with teamwork.

6 **Description of possible electives within the modules:** None

7 **Examination:**
[X] Final Module Exam [ ] Examinations for every part of the module

8 **Relevant Work:**

Number and Type; Connection to Course	Duration	Part of final mark in %
Written Exam	Up to 120 min.	70
6 exercises solved in groups of ca 5 students	Ca 15 pages per exercise – code pages containing ca 45 lines of code	30

9	**Study work:** **Number and Type; Connection to Course**	**Duration**
	None	
10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.	
11	**Weight of the module grade for the overall grade:** 5% (6 of 120 CP)	
12	**Module Prerequisites:** none	
13	**Presence:** Presence is recommended.	
14	**Use of the module for other course programs:** As an elective part of the Minor IS offered within the course program "Master of Science in Business Administration"	
15	**Responsible Lecturer:** Prof. Dr. Herbert Kuchen	**Department:** Münster School of Business and Economics
16	**Misc.:**	

Module Title:	Information Systems Development: Data Integration				
Course Program	Master of Science in Information Systems				
1	**Module No:** ISD2	**State:** compulsory in track ISD; optional as elective			**Language of Instruction:** English
2	**Turn:** every winter term	**Duration:** 1 term	**Semester:** 1-2	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Lecture		30 (2 CH)	60
2	E	Exercise, Case Study, Presentations		30 (2 CH)	60

4 **Contents:**

Background and relations to other courses: Data Integration is a core requirement for diverse information system development tasks, ranging from Web search and mash-ups to data warehousing and business intelligence.
In this course, a collection of tools and techniques is presented that can be applied in modern data integration tasks; these range from view construction and query processing in heterogeneous distributed databases to schema mapping and matching, Web services and mash-up APIs.
In this course, lectures are complemented by student presentations that provide additional content. In addition, exercises provide ample opportunities to apply the various techniques in realistic and practical settings.

Main topics and learning objectives: Students will become able to explain the problems, issues, solutions, techniques, and tools relating to data integration. They will be able not only to locate and present relevant sources and research in the area, but also to apply data integration techniques in practical scenarios. Moreover, they will be familiarized with the current research literature in the field.

Themes	Learning objectives
Introduction, Background, Architectures	To familiarize the audience with the problems, issues, solutions, techniques, and tools relating to data integration
Distributed Query Processing and Optimization	To become able to apply classical optimization techniques in distributed scenarios
Web Crawling, Search Engines, and Recommendation	To discuss and apply integration on the Web as the currently most dominating integration application
MapReduce	To discuss and apply tools for massive data integration and analysis
Mash-up creation	To get hands-on experience in a data integration task
Data cleansing, data fusion, data quality	To learn about basic activities in data integration
Schema matching, schema mapping	To appreciate formal issues arising when data schemas are present or given
GaV/LaV Modeling	To recognize the importance of traditional database topics (in this case relational algebra) in the novel context of data integration

5 **Learning outcomes:**

Academic: In the oral presentation, the student should demonstrate the ability
- to select, engage with, assess, and apply pieces of literature,
- to build a concise, yet coherent argument, and
- to identify open issues.

In the written examination, the student should demonstrate the ability
- to integrate and apply several concepts,
- to apply the concepts to a data integration scenario.

Soft skills: All assignments are group assignment. Hence the student should demonstrate the ability
- to productively work in groups,
- to coordinate with a peer.

6 **Description of possible electives within the modules:** None

7 **Examination:**
[X] Final Module Exam [ ] Examinations for every part of the module

8 **Relevant Work:**

	Number and Type; Connection to Course	**Duration**	**Part of final mark in %**
	Written Exam	Up to 120 Min.	60
	Case Study accompanied by 5 Exercises, presentation	Ca 8 pages per exercise (case study), ca 20 Min. (presentation)	40

9	**Study work:**	
	Number and Type; Connection to Course	**Duration**
	None	

10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.
11	**Weight of the module grade for the overall grade:** 5% (6 of 120 CP)
12	**Module Prerequisites:** Basic database knowledge
13	**Presence:** Presence is recommended.
14	**Use of the module for other course programs:** As an elective part of the Minor IS offered within the course program "Master of Science in Business Administration"

15	**Responsible Lecturer:** Prof. Dr. Gottfried Vossen	**Department:** Münster School of Business and Economics
16	**Misc.:**	

Module Title:	Information Systems Development: Advanced Concepts in Software Engineering				
Course Program	Master of Science in Information Systems				
1	**Module No:** ISD3	**State:** compulsory in track ISD; optional as elective	**Language of Instruction:** English		
2	**Turn:** every summer term	**Duration:** 1 term	**Semester:** 1-2	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Lecture		30 (2 CH)	45
2	E	Exercise		30 (2 CH)	75

4 **Contents:**

Background and relations to other courses: It is assumed that the students have some experience with programming and software development as they are taught in the bachelor program. The learned concepts and techniques are (often) helpful in the master thesis.

Main topics and learning objectives: The course consists of lectures providing the theoretical background of topical software-engineering concepts such as enterprise application integration and model-driven software development. Moreover, it consists of 5 assignments where these concepts are applied to develop and connect example information system.

Themes	Learning objectives
Enterprise Application Integration (EAI) concepts	Knowing and being able to evaluate typical EAI topologies and possible integration layers. Knowing corresponding communication paradigms.
Web applications and Middleware	Knowing typical concepts and frameworks for the development of enterprise applications. Being able to use these frameworks for developing enterprise applications with e.g. Java.
Web Services	Being able to connect existing enterprise applications using web-service technologies.
Message-oriented Middleware	Being able to connect enterprise applications using message-oriented middleware.
Model-Driven Software Development (MDSD)	Understanding the main concepts of MDSD such as automatically transforming a model to e.g. executable code as well as meta- and meta-meta-modeling.
Domain-Specific Languages	Knowing how to develop domain-specific languages (DSL) for a considered domain and to apply them.
Model-to-Text Transformations	Knowing and applying leading tools (such as Xtend) for describing model-to-text transformations.
Model-to-Model Transformations	Knowing and applying leading tools (such as QVTo) for describing model-to-model transformations.

5 **Learning outcomes:**

Academic: The students learn to know and apply current integration technologies for software systems within a company and across collaborating enterprises. Moreover, they learn how to increase the productivity of software development by automatically transforming abstract models to desired artifacts such as executable code.

Soft skills: The exercises are solved in teams of about 5 students. Thus, the students are trained to collaborate in teams.

6 **Description of possible electives within the modules:** None

7 **Examination:**
[X] Final Module Exam [ ] Examinations for every part of the module

8 **Relevant Work:**

Number and Type; Connection to Course	Duration	Part of final mark in %
Written Exam	Up to 120 Min.	70
4 Software Artifacts in groups of ca 5 students	Ca 20 pages per artifact – code pages containing ca 45 lines of	30

		code	

9	**Study work:** **Number and Type; Connection to Course**	**Duration**
	None	

10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.
11	**Weight of the module grade for the overall grade:** 5% (6 of 120 CP)
12	**Module Prerequisites:** none
13	**Presence:** Presence is recommended.
14	**Use of the module for other course programs:** As an elective part of the Minor IS offered within the course program “Master of Science in Business Administration”

15	**Responsible Lecturer:** Prof. Dr. Herbert Kuchen	**Department:** Münster School of Business and Economics
16	**Misc.:**	

Module Title:	Logistics, Production and Retail: Supply Chain Management				
Course Program	Master of Science in Information Systems				
1	**Module No:** LPR1	**State:** compulsory in track LPR; optional as elective			**Language of Instruction:** English
2	**Turn:** every winter term	**Duration:** 1 term	**Semester:** 1-2	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Lecture		30 (2 CH)	60
2	E	Exercise		30 (2 CH)	60

4

Contents: Supply chains focus onto value creation networks of often legally independent companies that are tightly connected via different linkages or flows (e.g. material, information and financial flows). The course "Supply Chain Management (SCM)" elaborates those linkages across companies and specifically addresses issues of supply chain design, planning, coordination and optimization. Collaborative process concepts integrating the different business activities of the companies in the supply chain are investigated in detail. For each lectured topic related IT-Systems are introduced and their application in Supply Chain Management is discussed. Furthermore, the different modes of usage and architectures of Information Systems in Supply Chain Management are examined. Case studies carried out with the help of SCM tools currently used in practice underline the practical aspects of the contents taught.

Background and relations to other courses: The production and retail module studies companies in the context of the intra- and inter-organizational processes of all acting companies in a supply chain. The Supply Chain Management course encompasses topics like the principle tasks of designing, planning, and executing a supply chain under the usage of different modelling approaches and related information systems. It complements the other industry-driven courses of the module (Production Planning and Control, Retail) by introducing general Supply Chain concepts interlinking the activities of retail and production. The adaption of these concepts to specific industry sectors is part of the other courses of the track.

Main topics and learning objectives:

Themes	Learning objectives
Basic Principles of Supply Chain Management	To learn about basic terms, ideas, challenges and targets of Supply Chain Management.
Supply Chain Modeling	To learn about the basic elements to be modeled in a supply chain. To understand the intention and objectives of modeling supply chains and to be able to create such a model.
Supply Chain Design	To learn about the relevant influencing factors for supply chain design decisions and to understand design options and principles.
Supply Chain Planning	To understand the core tasks of supply chain planning and the methods being used for demand planning, network planning, supply planning, production planning and distribution planning as well as the objectives and key indicators of order promising.
Supply Chain Execution	To learn about the scope of supply chain execution. To get a basic understanding of the basic concepts and functions of Supply Chain Event Management.
IT-Systems in Supply Chain Management	To get an idea of features and characteristics of different SCM software systems.

5

Learning outcomes:

Academic: The course's major academic outcome is a broad and profound understanding of supply chains' challenges, targets, and related concepts for managing supply chain activities. Furthermore, a profound knowledge in actual methods and concepts of supply chain design, modeling, planning, and optimization should be obtained.

Soft skills: Students are encouraged to prepare the contents of the lecture and exercise and to perform follow-up work in teams. This is supported by a Learnweb discussion forum that is guided by the chair. Case studies that accompany the lecture especially in Supply Chain Design and Planning provide the opportunity for students to get acquainted to selected SCM tools and to apply them in a realistic scenario. The case studies are organized as group work and thus promote the students' ability to cooperate in teams. The intermediary results are presented regularly by the groups in front of the complete audience. This enhances the students' presentation and discussion skills.

6 **Description of possible electives within the modules:** None

7 **Examination:**

	[X] Final Module Exam [ ] Examinations for every part of the module	
8	**Relevant Work:**	
	Number and Type; Connection to Course	**Duration** / **Part of final mark in %**
	Written Exam	Up to 120 Min. / 60
	Documentation/Presentation	Ca 40 pages/ca 30 Min. / 40
9	**Study work:**	
	Number and Type; Connection to Course	**Duration**
	None	
10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.	
11	**Weight of the module grade for the overall grade:** 5% (6 of 120 CP)	
12	**Module Prerequisites:** None	
13	**Presence:** Presence is recommended.	
14	**Use of the module for other course programs:** As an elective part of the Minor IS offered within the course program "Master of Science in Business Administration"	
15	**Responsible Lecturer:** Prof. Dr.-Ing. Bernd Hellingrath	**Department:** Münster School of Business and Economics
16	**Misc.:**	

Module Title:	Logistics, Production and Retail: Production Planning and Control
Course Program	Master of Science in Information Systems

1	**Module No:** LPR2	**State:** compulsory in track LPR; optional as elective	**Language of Instruction:** English

2	**Turn:** Every winter term	**Duration:** 1 term	**Semester:** 1-2	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Lecture		30 (2 CH)	60
2	E	Exercise		30 (2 CH)	60

4 **Contents:**

Background and relations to other courses: The "Production Planning and Control" (PPC) lecture addresses the adaptation of process modeling concepts to the manufacturing sector. Taking an integrated process perspective data structures, information flows and business functions relevant to this domain are presented. The course encompasses processes like material management, capacity management, computer aided design, computer aided manufacturing, and computer aided quality assurance in an integrated manner.

Main topics and learning objectives: The students learn to know the different approaches of PPC. Moreover, they learn to use the corresponding methods and instruments. In sum, the students shall gain insight into the theories behind Production Planning and Control and techniques proposed for tasks and be able to assess these tasks and the underlying theories critically.

Themes	Learning objectives
Demand Management	To be able to explain and apply the concepts as well as to be able to explain the rationale behind them.
Materials Management, Inventory Control, Scheduling and Capacity Management	To be able to explain and apply the concepts as well as to be able to explain the rationale behind them.
Data Models	To be able to understand the underlying data structures and information needs in PPC.
IT Systems	To get an overview of the main IT systems in PPC and get used to ERP usage in PPC.
Cost Engineering	To be able to explain and apply the concepts as well as to be able to explain the rationale behind them.
Smart Factory	To be able to understand how innovative IT capabilities and services influence production processes.

5 **Learning outcomes:**

Academic: To understand and to be able to apply the addressed topics

Soft skills: To manage and to organize group work regarding given task and presentations

6 **Description of possible electives within the modules:** None

7 **Examination:**

[X] Final Module Exam [ ] Examinations for every part of the module

8 **Relevant Work:**

Number and Type; Connection to Course	Duration	Part of final mark in %
Written Exam	Up to 120 min.	100%

9 **Study work:**

Number and Type; Connection to Course	Duration
None	

10 **Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.

11 **Weight of the module grade for the overall grade:** 5% (6 of 120 CP)

12 **Module Prerequisites:** None

14 **Use of the module for other course programs:** As an elective part of the Minor IS offered within the course

	program “Master of Science in Business Administration”	
13	**Presence:** Presence is recommended.	
15	**Responsible Lecturer:** Prof. Dr. Dr. h. c. Jörg Becker	**Department:** Münster School of Business and Economics
16	**Misc.:**	

Module Title:	Logistics, Production and Retail: Retail
Course Program	Master of Science in Information Systems

1	**Module No:** LPR3	**State:**compulsory in track LPR; optional as elective	**Language of instruction:** English

2	**Turn:** Every summer term	**Duration:** 1 term	**Semester:** 1-2	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Lecture	3	30 (2 CH)	60
2	E	Exercise	3	30 (2 CH)	60

4

Contents: The retail course as part of the production and retail module presents retail as an important sector for the economy. It uses reference models for retail as a framework to introduce retail business process and data structures. To highlight the integration of business processes and information technology, the ERP system selection and implementation process is elaborated. Process and data modeling techniques are applied throughout the lecture and accompanying exercises.

Background and relations to other courses: The course is complementary to the courses Production Planning and Control and Supply Chain Management and Logistics.

Main topics and learning objectives:

Themes	Learning objectives
Business Processes in Retail	The students get to know reference models for retail. They understand core processes, coordination processes, support processes and their integration.
Process Modeling	The students are able to model business processes in retail, especially with the help of domain specific, semantic modeling languages.
Data Modeling	The students are able to model data structures and get to know selected data models in retail.
ERP-Systems for Retail	The students understand the importance of ERP-systems in retail and their selection and implementation process.

5 **Learning outcomes:**

Academic: The students recognize information systems and the underlying business processes in retail as an important sector for the economy. They understand the cross-departmental integration of business processes and how retail companies are embedded in the value chain. They deepen their knowledge in process and data modeling and are able to apply methods and techniques in various application scenarios.

Soft skills: The exercises comprise both individual work and team-based group work. The students apply and improve their capabilities in team work, presentation and discussion.

6 **Description of possible electives within the modules:** None

7 **Examination:**
[X] Final Module Exam [ ] Examinations for every part of the module

8 **Relevant Work:**

Number and Type; Connection to Course	Duration	Part of final mark in %
Written exam	Up to 120 Min.	100

9 **Study work:**

Number and Type; Connection to Course	Duration
None	

10 **Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.

11 **Weight of the module grade for the overall grade:** 5% (6 of 120 CP)

12 **Module Prerequisites:** As an elective part of the Minor IS offered within the course program "Master of Science in Business Administration"

13 **Presence:** Presence is recommended.

15

Responsible Lecturer:	Department:
Prof. Dr. Dr. h. c. Jörg Becker	Münster School of Business and Economics

16 **Misc.:**

Module Title:	Elective Modules (Seminar)
Course Program	Master of Science in Information Systems

1	**Module No: EMSem1-6**	**State:** Compulsory	**Language of Instruction:** English

2	**Turn:** every term	**Duration:** 1 term	**Semester:** 1–4	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Seminar		60 (4 CH)	120

4

Contents: The elective seminars deal with topics that arise from recent research. They are usually organized in small groups of students. Each student gives a seminar talk and, to this end, writes a seminar elaboration. Main seminar-topics may change from term to term.

Background and relations to other courses: Usually, the topics deepen the contents of one (or more) of the tracks IM, PM, BN, BI, ISD and LPR. Therefore, knowledge of the contents of pertaining track(s) is strongly recommended.

Main topics and learning objectives: To follow recent developments, the topics and, accordingly, the learning objectives are changing from term to term. Examples of earlier topics have been:

- Structural Model Analysis
- Model Visualisation - Layout and Perception
- Network Evolution
- Beautiful Data
- ERP systems in industry, retail and supply chains
- Information Retrieval
- Coordination in Supply Chain Management
- Theoretical Computer Science

5

Learning outcomes:

Academic: The students deepen their knowledge in specific topics.

Soft skills: Students improve their skills in acquiring profound scientific knowledge and presentation. Depending on the topic, group working abilities are supported.

6 **Description of possible electives within the modules:**
None

7 **Examination:**
[] Final Module Exam [X] Examinations for every part of the module

8 **Relevant Work:**

Number and Type; Connection to Course	Duration	Part of final mark in %
Seminar elaboration and talk	Ca 20 pages, ca 60 Minutes	100

9 **Study work:**

Number and Type; Connection to Course	Duration
None	

10 **Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.

11 **Weight of the module grade for the overall grade:** 5% (6 of 120 CP)

12 **Module Prerequisites:** None

13 **Presence:** Presence is required during presentations. Authorized absence in less than 20% of all presentations is possible.

14 **Use of the module for other course programs:** None

15	**Responsible Lecturer:** Prof. Dr. Heike Trautmann	**Department:** Münster School of Business and Economics

16 **Misc.:**

Module Title:	Selected Chapters in Business Administration				
Course Program	Master of Science in Information Systems				
1	**Module No:** EM-SCBA	**State:** Optional			**Language of Instruction:** English/German
2	**Turn:** every term	**Duration:** 1 term	**Semester:** 1–4	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Lecture		30 (2 CH)	60
2	E	Exercise		30 (2 CH)	60

4 **Contents:**

Choosing a 6CP Lecture with Exercises in the "Minor" programs of the Master program of Business Administration offered by the department of Business Administration, namely: "Basis Accounting", "Basis Finance", "Basis Management" and "Basis Marketing". In particular, the following Modules can be studied:

ACM01 Konzepte und Instrumente des Controlling

ACM02 Financial Accounting

ACM03 Internationale Unternehmensbesteuerung

ACM04 Internationales Controlling

ACM07 Unternehmensanalyse und –bewertung

ACM08 Unternehmensbesteuerung I

ACM09 Ausgewählte Kapitel des Accounting

ACM10 Abschlussprüfung

ACM11 Spezialfragen der Rechnungslegung nach HGB und IFRS

ACM12 Ausgewählte Kapitel des Accounting II

ACM13 Anwendungen des Controlling

ACM14 IFRS und Controlling

ACM16 Vertiefungsmodul Internationale Rechnungslegung

ACM17 Unternehmensbesteuerung II

FCM01 Introduction to Finance

FCM02 Behavioral Finance

FCM03 Derivatives I

FCM04 Finanzintermeidation I

FCM05 Advanced Corporate Finance

FCM06 Corporate Governance and Responsible Business Practices

FCM07 Derivatives II

FCM08 Finanzintermediation II

FCM13 Ausgewählte Kapitel Finance I

CfM13 Organisation

CfM14 Strategisches Management

CfM15 Personal

CfM16 Management

MCM02 Industrial Marketing

MCM03 Consumer Marketing

	MCM04 Media Marketing MCM08 Direct Marketing MCM09 Sales Management MCM10 Electronic Commerce MCM11 Advanced Media Marketing MCM14 Marketing Strategy Preconditions defined for the selected modules have to be obeyed.
	Background and relations to other courses: to be found in the descriptions of the above mentioned modules
	Main topics and learning objectives: to be found in the descriptions of the above mentioned modules
5	**Learning outcomes:** (in general) The students deepen their knowledge in specific topics
	Academic: to be found in the descriptions of the above mentioned modules
	Soft skills: to be found in the descriptions of the above mentioned modules
6	**Description of possible electives within the modules:** None
7	**Examination:** [X] Final Module Exam [ ] Examinations for every part of the module
8	**Relevant Work:** See module descriptions within the Master program of the department of Business Administration
9	**Study work:**

Number and Type; Connection to Course	**Duration**
None	

10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.
11	**Weight of the module grade for the overall grade:** 5% (6 of 120 CP)
12	**Module Prerequisites:** None
13	**Presence:** Presence is recommended.
14	**Use of the module for other course programs:** None

15	**Responsible Lecturer:** Prof. Dr. Heike Trautmann	**Department:** Münster School of Business and Economics
16	**Misc.:**	

Module Title:	Selected Chapters in Computer Science				
Course Program	Master of Science in Information Systems				
1	**Module No:** SCCS 1-5	**State:** Compulsory		**Language of Instruction:** English	
2	**Turn:** every term	**Duration:** 1 term	**Semester:** 1–4	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1	L	Lecture		30 (2 CH)	60
2	E	Exercise		30 (2 CH)	60

4

Contents:
Choosing Lecture/Exercise-modules with 6 CP from the Master program of the department of Computer Science

Background and relations to other courses: to be found in the descriptions of the above mentioned modules

Main topics and learning objectives: to be found in the descriptions of the above mentioned modules

5

Learning outcomes: (in general) The students deepen their knowledge in specific topics

Academic: to be found in the descriptions of the above mentioned modules

Soft skills: to be found in the descriptions of the above mentioned modules

6 **Description of possible electives within the modules:**
None

7 **Examination:**
[X] Final Module Exam [ ] Examinations for every part of the module

8 **Relevant Work: written exam (up to 120 min)**

9 **Study work:**

Number and Type; Connection to Course	Duration
None	

10 **Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.

11 **Weight of the module grade for the overall grade:** 5% (6 of 120 CP)

12 **Module Prerequisites:** None

13 **Presence:** Presence is recommended.

14 **Use of the module for other course programs:** None

15 **Responsible Lecturer:** Prof. Dr. Heike Trautmann | **Department:** Münster School of Business and Economics

16 **Misc.:**

Module Title:	Project Seminar				
Course Program	Master of Science in Information Systems				
1	**Module No:** PS	**State:** Compulsory		**Language of Instruction:** English	
2	**Turn:** every term	**Duration:** 1term	**Semester:** 3-4	**CP:** 12	**Workload (h):** 360

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1		Project Seminar	12	120 (8CH)	240

4

Contents: In the project seminar, students realize an IS-project in a team.

Background and relations to other courses:
The material and methods that were introduced in former Tracks IM, PM, BN, BI, ISD and/or LPR will be applied in a practice-oriented project to solve a realistic, complex problem. The project is often performed in collaboration with a partner from industry. The experience gained in the project seminar can be helpful for the Master thesis.

Main topics and learning objectives:
The material and methods learned in previous courses are applied in a practice-oriented project with topics varying from term to term. In particular teamwork, project planning and management, development of a business concept, design of a corresponding software architecture, implementation, and testing will be trained. Moreover, the intermediate and final results of the project will be presented using state-of-the-art tools. The participants also have to read relevant literature and describe required concepts in papers. The students are supported in all these activities by tutors.
The topics vary from term to term. Frequently, they originate from current research-questions that have

Themes	Learning objectives
Writing scientific papers	Read and understand scientific literature. Describe the read material well-structured, understandably, and precisely in own words in a paper
Presentation	Present the material described in the paper orally using state-of-the-art tools (such as e.g. Powerpoint) in a well-structured, understandable, and precise way.
Project work	Solve a realistic task in a project team.
Project management	Manage a project taking into account limited time and resources. Divide a complex task into activities and assign them to team members. Coordinate the activities in the project.

5

Learning outcomes:

Academic: The students learn to apply theoretical concepts in a practical environment given by a specific (e.g. industrial) project.

Soft skills: Students learn to realize a project in a team. They acquire several soft skills, e.g. in presentations, writing of scientific texts, and collaboration in teams as well as media competence

6 **Description of possible electives within the modules:** None

7 **Examination:**
[X] Final Module Exam [ ] Examinations for every part of the module

8 **Relevant Work:**

Number and Type; Connection to Course	Duration	Part of final mark in %
Project documentation, 2 intermediate and 1 final presentation;	ca 30 pages, ca 90 min./presentation	100

9 **Study work:**

Number and Type; Connection to Course	Duration

10 **Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.

11 **Weight of the module grade for the overall grade:** 10% (12 of 120 CP)

12 **Module Prerequisites:** Concrete Project Seminars may require certain modules from IM, PM, BN, ISD, BI

	and/or LPR.	
13	**Presence:** Presence is recommended during project work and is required during presentations. As the required work can only be assessed, when all participants are present during presentations, an absence is not possible. If absent, the seminar has to be repeated	
14	**Use of the module for other course programs:** None	
15	**Responsible Lecturer:** Prof. Dr. Heike Trautmann	**Department:** Münster School of Business and Economics
16	**Misc.:**	

Module Title:	Master's thesis module				
Course Program	Master of Science in Information Systems				
1	**Module No:** MT	**State:** Compulsory		**Language of Instruction:** English	
2	**Turn:** every term	**Duration:** 1 term	**Semester:** 3-4	**CP:** 30	**Workload (h):** 900

3 **Module Structure:**

No	Type	Course	CP	Presence (h + CH)	Self-Study (h)
1		Writing the thesis	30		750
2		Thesis defense			60
4	E	Research methods		30 (2CH)	60

4

Contents: With his/her master's thesis, a student is supposed to prove his/her ability to take part in the scientific process by doing a small piece of research and write an appropriate paper on it. The thesis should have a length of approximately 80 pages. The thesis defense contains a presentation of the thesis' contents as well as a discussion.

Background and relations to other courses: The master thesis is written in the research context of one of the method tracks IM, PM, BN, BI and/or ISD.

Main topics and learning objectives: Those are subject to the topic and area where the thesis is intended. The thesis defense covers the thesis' topic.

5

Learning Outcomes:

Academic: The student can handle a research topic in a scientific way and apply the results to practical problems. He or she can present and defend approaches, underlying theory and results.

Soft skills: The student can handle the formal requirements associated to a research paper: investigating the research context, collecting material from the scientific literature, performing and processing bibliographical inquiries, presenting own ideas in the scientific environment of the given topic.

6 **Description of possible electives within the modules:** None

7 **Examination:**
[] Final Module Exam [X] Examinations for every part of the module

8 **Relevant Work:**

Number and Type; Connection to Course	Duration	Part of final mark in %
Master's thesis		100

9 **Study work:**

Number and Type; Connection to Course	Duration
Thesis defense	Max. 1hour (oral)

10 **Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.

11 **Weight of the module grade for the overall grade:** 25% (30 of 120 CP)

12 **Module Prerequisites:** 60 credit points.

13 **Presence:** Presence is recommended.

14 **Use of the module for other course programs:** None

15	**Responsible Lecturer** Prof. Dr. Heike Trautmann	**Department:** Münster School of Business and Economics

16 **Misc.:**