Subdivided Module Catalogue

for the Subject

Keine PO-STG-Zuordnung vorhanden

Responsible: JMU Würzburg

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Learning Outcomes

German contents and learning outcome available but not translated yet.

Der Master-Studiengang Information Systems wird von der Wirtschaftswissenschaftlichen Fakultät der JMU als forschungsorientierter Studiengang mit dem Abschluss „Master of Science" (M. Sc.) im Rahmen eines konsekutiven Bachelor- und Master- Modells angeboten. Der Grad des Master of Science stellt einen weiteren forschungsorientierten und berufsqualifizierenden Abschluss dar; die im Rahmen des Masterstudiums erworbene Qualifikation entspricht der eines Diplom-Wirtschaftsinformatikers bzw. einer Diplom-Wirtschaftsinformatikerin.

Im Masterstudiengang Information Systems erwerben die Studierenden vertiefte Kenntnisse und Fähigkeiten im Bereich der Wirtschaftsinformatik und erlangen so eine hohe wissenschaftliche und anwendungsbezogene Qualifikation und Selbstständigkeit auf diesem Gebiet. Die Studierenden lernen Aufgabenstellungen und Systeme der Wirtschaftsinformatik zu analysieren, Defizite zu identifizieren und unter Einsatz etablierter sowie neuer Methoden und Techniken systematisch eine konzeptionell neue bzw. verbesserte Lösung zu erarbeiten. Durch die Master-Prüfung weist der Kandidat bzw. die Kandidatin nach, dass er bzw. sie fundierte Fachkenntnisse erworben hat und Aufgaben dieser Themenbereiche selbständig bearbeiten kann.

Die Masterprüfung führt zu einem zweiten berufsqualifizierenden Abschluss, welcher auf einem Bachelorstudiengang im Bereich Wirtschaftsinformatik bzw. auf einem wirtschaftswissenschaftlichen Bachelorstudiengang mit einer Schwerpunktsetzung im Bereich Wirtschaftsinformatik aufbaut. Durch die Masterprüfung wird festgestellt, ob die Studierenden die Zusammenhänge im Bereich Wirtschaftsinformatik so beherrschen, dass sie einen eigenen Forschungsbeitrag darin leisten können.

Durch die Ausbildung und Schulung des analytischen Denkens erwerben die Studierenden die Fähigkeit, sich später in die an sie herangetragenen Aufgabengebiete einzuarbeiten und insbesondere das bereits aus dem Bachelorstudium erworbene Grundwissen in einem Masterstudiengang selbständig anzuwenden sowie auf neue Aufgabenstellungen zu übertragen. Die Absolventinnen und Absolventen sind in der Lage, Informationen im ökonomischen Kontext differenziert zu betrachten und sie mit geeigneten Modellen und Methoden zu analysieren und zu bewerten. Unter Berücksichtigung ethischer und ökologischer Fragestellungen können sie Potenziale und Risiken abschätzen sowie nachhaltige Verbesserungen oder Lösungen entwickeln. Ihre Urteile sind wissenschaftlich fundiert und beziehen die Abschätzung ökologischer und gesellschaftlicher Folgen ein. Die Absolventinnen und Absolventen sind in der Lage, ihre Entscheidungen zu erläutern und unter Beachtung wissenschaftlicher Grundsätze zu verteidigen.

Die Absolventinnen und Absolventen können am wissenschaftlichen Diskurs mit Fachvertreterinnen und Fachvertretern teilnehmen. Sie haben die notwendigen unternehmerischen, interkulturellen und Innovationskompetenzen für verantwortungsvolle Positionen in internationalen Teams und Unternehmen erworben. Neben Tätigkeiten in der Praxis sollen die Absolventen bzw. Absolventinnen befähigt werden, in Universitäten und wissenschaftlichen Einrichtungen tätig zu werden.

Zum Erreichen der Ziele ist ein hohes Maß an Eigeninitiative der Studierenden erforderlich. Studieren bedeutet insbesondere auch ein Selbststudium und das Studieren in Arbeitsgruppen. Die wissenschaftliche Literatur ist dabei eine unentbehrliche Hilfe.

Für den Erfolg im Studium und den beruflichen Erfolg nach dem Studium sind die Beherrschung der englischen Sprache und möglichst einer weiteren Fremdsprache in Wort und Schrift sowie Kenntnisse in Rhetorik und Präsentationstechniken besonders förderlich. Die Entwicklung dieser Kenntnisse fordert die eigene Initiative der Studierenden über das Lehrangebot hinaus. Das Studium fördert die Persönlichkeitsentwicklung und Ausbildung interkultureller Kompetenzen durch entsprechende Lehrangebote (auch in englischer Sprache) sowie die Förderung von Auslandsaufenthalten durch zahlreiche Partnerprogramme und die vereinfachte Anerkennung von im Ausland erworbenen Leistungen.

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Abbreviations used

Course types: **E** = field trip, **K** = colloquium, **O** = conversatorium, **P** = placement/lab course, **R** = project, **S** = seminar, **T** = tutorial, **Ü** = exercise, **V** = lecture

Term: **SS** = summer semester, **WS** = winter semester

Methods of grading: **NUM** = numerical grade, **B/NB** = (not) successfully completed

Regulations: **(L)ASPO** = general academic and examination regulations (for teaching-degree programmes), **FSB** = subject-specific provisions, **SFB** = list of modules

Other: **A** = thesis, **LV** = course(s), **PL** = assessment(s), **TN** = participants, **VL** = prerequisite(s)

Conventions

Unless otherwise stated, courses and assessments will be held in German, assessments will be offered every semester and modules are not creditable for bonus.

Notes

Should there be the option to choose between several methods of assessment, the lecturer will agree with the module coordinator on the method of assessment to be used in the current semester by two weeks after the start of the course at the latest and will communicate this in the customary manner.

Should the module comprise more than one graded assessment, all assessments will be equally weighted, unless otherwise stated below.

Should the assessment comprise several individual assessments, successful completion of the module will require successful completion of all individual assessments.

In accordance with

the general regulations governing the degree subject described in this module catalogue:

>   **ASPO2015**

associated official publications (FSB (subject-specific provisions)/SFB (list of modules)):

>   **??-???-2025 (2025-??)**

This module handbook seeks to render, as accurately as possible, the data that is of statutory relevance according to the examination regulations of the degree subject. However, only the FSB (subject-specific provisions) and SFB (list of modules) in their officially published versions shall be legally binding. In the case of doubt, the provisions on, in particular, module assessments specified in the FSB/SFB shall prevail.

Subdivided Module Catalogue for the Subject
Information Systems
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The subject is divided into

Abbreviation	Module title	ECTS credits	Method of grading	page
Compulsory Courses (30 ECTS credits)				
12-M-IS-262-m01	Information Systems	5	NUM	61
12-M-PSI-262-m01	Project Seminar	15	NUM	71
12-M-SMIS-262-m01	Seminar: Master Information Systems	10	NUM	74
Compulsory Electives I: Fundamentals Computer Science (20 ECTS credits)				
10-I=IR-242-m01	Information Retrieval	5	NUM	14
10-I=SSS-232-m01	Security of Software Systems	5	NUM	35
10-I=SAR-161-m01	Software Architecture	5	NUM	30
10-I=KI1-212-m01	Artificial Intelligence 1	5	NUM	15
10-I=ST-232-m01	Discrete Event Simulation	5	NUM	37
10-I=APR-252-m01	Advanced Programming	5	NUM	9
10-I=NLP-212-m01	Machine Learning for Natural Language Processing	5	NUM	23
10-I=KI2-212-m01	Artificial Intelligence 2	5	NUM	17
10-I=PNN-252-m01	Programming with neural nets	5	NUM	28
10-I=SB-252-m01	Systems Benchmarking	5	NUM	32
10-AI=CV1-242-m01	Computer Vision 1	5	NUM	7
10-I=IP-222-m01	Image Processing and Computational Photography	5	NUM	12
10-I=MNLP-232-m01	Multilingual NLP	5	NUM	21
10-I=SNA-232-m01	Statistical Network Analysis	5	NUM	33
10-I=OR-232-m01	Operations Research	5	NUM	25
10-I=MLN1-232-m01	Machine Learning for Networks 1	5	NUM	19
10-I=DM-232-m01	Data Science	5	NUM	10
Compulsory Electives II: Tracks (40 ECTS credits)				
Out of the four tracks, students may select two.				
Track 1: Enterprise Systems (20 ECTS credits)				
Core (10 ECTS credits)				
12-M-GPU-262-m01	Business Software 1: Management and Implementation of Information Systems	5	NUM	55
12-M-ERP-262-m01	Business Software 2: Data-driven Business Process Management and Automation	5	NUM	50
Core Electives (10 ECTS credits)				
10-I=PM-252-m01	Professional Project Management	5	NUM	27
10-I=PRJAK-252-m01	Project - Current Topics in Computer Science	5	NUM	29
12-M-HRM-262-m01	Human Resource Management and Industrial Relations	5	NUM	57
10-I=SAR-161-m01	Software Architecture	5	NUM	30
12-M-ESE-262-m01	Entrepreneurship in Software-Ecosystems: Start & Scale Up, Venture Capital, Private Equity, EXIT	5	NUM	52
12-M-TES-262-m01	Topics in Enterprise Systems	5	NUM	80
Track 2: Business Analytics (20 ECTS credits)				
Core (10 ECTS credits)				
12-M-DSS-262-m01	Decision Support Systems	5	NUM	43
12-M-AOLM-262-m01	Advanced Operations & Logistics Management	5	NUM	39
12-M-BI-262-m01	Analytical Information Systems	5	NUM	42

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Information Systems
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Core Electives (10 ECTS credits)				
12-M-BI-262-m01	Analytical Information Systems	5	NUM	42
12-M-EAI-262-m01	Enterprise AI	5	NUM	44
10-I=OR-232-m01	Operations Research	5	NUM	25
12-M-GLSC-262-m01	Global Logistics & Supply Chain Management	5	NUM	54
12-M-ATDS-262-m01	Practical Data Science	5	NUM	40
12-M-TE-262-m01	Applied Topics in Data Science in Business and Economics	5	NUM	78
12-M-PEM-262-m01	Policy and Management Evaluation Methods	5	NUM	67
12-M-TDS-262-m01	Applied Data Analysis and Machine Learning	5	NUM	77
12-M-OEDT-262-m01	Organizational Economics and Digital Transformation	5	NUM	65
12-M-AOLM-262-m01	Advanced Operations & Logistics Management	5	NUM	39
12-M-DSS-262-m01	Decision Support Systems	5	NUM	43
12-M-OIP-262-m01	Optimization in Practice	5	NUM	66
12-M-EE-262-m01	Experimental Economics	5	NUM	48
12-M-TBA-262-m01	Topics in Business Analytics	5	NUM	76
Track 3: Electronic Business (20 ECTS credits)				
Core (10 ECTS credits)				
12-M-IBS-262-m01	Digital Strategy	5	NUM	59
12-M-MUS-262-m01	Mobile and Ubiquitous Business	5	NUM	64
Core Electives (10 ECTS credits)				
12-M-UGF1-262-m01	Corporate Entrepreneurship and Innovation	5	NUM	81
12-M-UGF2-262-m01	Corporate Strategy	5	NUM	83
12-M-UGF3-262-m01	Digital Entrepreneurship and Digital Transformation	5	NUM	85
12-M-MA-262-m01	Marketing Analytics	5	NUM	62
12-M-ESE-262-m01	Entrepreneurship in Software-Ecosystems: Start & Scale Up, Venture Capital, Private Equity, EXIT	5	NUM	52
12-M-PIPM-262-m01	Product Innovation and Price Management	5	NUM	69
12-M-EC1-262-m01	E-Commerce	5	NUM	46
12-M-SMGS-262-m01	Strategic Management of Global Supply Chains	5	NUM	73
12-M-INST-262-m01	Strategic Managerial Accounting	5	NUM	60
12-M-TEB-262-m01	Topics in Electronic Business	5	NUM	79
Track 4: Artificial Intelligence (20 ECTS credits)				
Core (10 ECTS credits)				
12-M-EAI-262-m01	Enterprise AI	5	NUM	44
12-M-BI-262-m01	Analytical Information Systems	5	NUM	42
12-M-ATDS-262-m01	Practical Data Science	5	NUM	40
Core Electives (10 ECTS credits)				
10-AI=CV1-242-m01	Computer Vision 1	5	NUM	7
12-M-EAI-262-m01	Enterprise AI	5	NUM	44
12-M-BI-262-m01	Analytical Information Systems	5	NUM	42
12-M-ATDS-262-m01	Practical Data Science	5	NUM	40
12-M-MA-262-m01	Marketing Analytics	5	NUM	62
12-M-TE-262-m01	Applied Topics in Data Science in Business and Economics	5	NUM	78
12-M-PEM-262-m01	Policy and Management Evaluation Methods	5	NUM	67
10-I=SNA-232-m01	Statistical Network Analysis	5	NUM	33
10-I=NLP-212-m01	Machine Learning for Natural Language Processing	5	NUM	23

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10-I=MNLP-232-m01	Multilingual NLP	5	NUM	21
12-M-TAI-262-m01	Topics in Artificial Intelligence	5	NUM	75
Thesis (30 ECTS credits)				
12-WI-MA-262-m01	Master Thesis Information Systems	30	NUM	87

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title		Abbreviation
Computer Vision 1		10-AI=CV1-242-m01

Module coordinator		Module offered by
holder of the Chair of Computer Science IV		Institute of Computer Science

ECTS	Method of grading	Only after succ. compl. of module(s)	
5	numerical grade	--	

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

The lecture provides knowledge about current methods and algorithms in the field of computer vision. Important basics as well as the most recent approaches to image representation, image processing and image analysis are taught.
Topics include data representation, image acquisition, restoration and enhancement, features, object modeling, image and video understanding, deep learning and generative methods and applications.
Actual models and methods of machine learning as well as their technical backgrounds are presented and their respective applications in Computer Vision are shown.

Intended learning outcomes

Students have fundamental knowledge of problems and techniques in the field of computer vision and are able to independently identify and apply suitable methods for concrete problems.
- Overview of the most important concepts of image representation, image analysis, machine learning and algorithms from Computer Vision
- Gaining experience through home assignments, practical computer and programming exercises
- Providing a sound solid background knowledge for the advanced Computer Vision 2 course

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Written examination (approx. 60 to 120 minutes)
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: English
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: every year, summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Artificial Intelligence & Extended Reality (2024)
Master's degree (1 major) Artificial Intelligence (2024)
Master's degree (1 major) Management (2024)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Master's degree (1 major) Information Systems (2024)
Master's degree (1 major) Economathematics (2024)
Master's degree (1 major) Information Systems (2025)
Master's degree (1 major) Management (2025)
Master's degree (1 major) Mathematical Data Science (2025)
Master's degree (1 major) Economathematics (2025)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title		Abbreviation
Advanced Programming		10-I=APR-252-m01

Module coordinator	Module offered by
holder of the Chair of Computer Science II	Institute of Computer Science

ECTS	Method of grading	Only after succ. compl. of module(s)	
5	numerical grade	--	

Duration	Module level	Other prerequisites	
1 semester	graduate	--	

Contents

With the knowledge of basic programming, taught in introductory lectures, it is possible to realize simpler programs. If more complex problems are to be tackled, suboptimal results like long, incomprehensible functions and code duplicates occur. In this lecture, further knowledge is to be conveyed on how to give programs and code a sensible structure. Also, further topics in the areas of software security and parallel programming are discussed.

Intended learning outcomes

Students learn advanced programming paradigms. Different patterns are then implemented in multiple languages and their efficiency measured using standard metrics. In addition, parallel processing concepts are introduced culminating in the use of GPU architectures for extremely quick processing.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes)
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): SE, KI, LR, HCI, ES, GE, SEC, IN

Workload

150 h

Teaching cycle

Teaching cycle: every year, winter semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Information Systems (2025)
Master's degree (1 major) Computer Science (2025)
Master's degree (1 major) Aerospace Computer Science (2025)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Data Science	10-I=DM-232-m01

Module coordinator	Module offered by
holder of the Chair of Computer Science X	Institute of Computer Science

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Foundations in the following areas: definition of data mining and knowledge, discovery in databases, process model, relationship to data warehouse and OLAP data preprocessing, data visualisation, unsupervised learning methods (cluster- and association methods), supervised learning (e. g. Bayes classification, KNN, decision trees, SVM), learning methods for special data types, further learning paradigms.

Intended learning outcomes

The students possess a theoretical and practical knowledge of typical methods and algorithms in the area of data mining and machine learning. They are able to solve practical knowledge discovery problems with the help of the knowledge acquired in this course and by using the KDD process. They have acquired experience in the use or implementation of data mining algorithms.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes)
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): IT, KI, HCI, GE, SEC, IN

Workload

150 h

Teaching cycle

Teaching cycle: every year, summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Information Systems (2019)
Master's degree (1 major) Information Systems (2022)
Master's degree (1 major) Computer Science (2023)
Master's degree (1 major) Aerospace Computer Science (2023)
Master's degree (1 major) Management (2024)
Master's degree (1 major) Information Systems (2024)
Master's degree (1 major) Economathematics (2024)
Master's degree (1 major) Information Systems (2025)

Subdivided Module Catalogue for the Subject
Information Systems
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Master's degree (1 major) Management (2025)
Master's degree (1 major) Computer Science (2025)
Master's degree (1 major) Economathematics (2025)
Master's degree (1 major) Aerospace Computer Science (2025)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Image Processing and Computational Photography	10-I=IP-222-m01

Module coordinator	Module offered by
holder of the Chair of Computer Science IV	Institute of Computer Science

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

This course aims at offering a self-contained account of image processing and computational photography and its underlying concepts, including the recent use of deep learning. The topics that will be covered are:
- introduction to image processing and computational photography
- sampling and quantization
- light and color
- image acquisition
- deep learning
- generative methods
- image signal processing
- image restoration
- sensor and image quality assessment
- image compression
- applications

Intended learning outcomes

Students have fundamental knowledge of problems and techniques in the field of image processing and computational photography and are able to independently identify and apply suitable methods for concrete problems.
- Overview of the most important concepts of image formation, perception and analysis, and Computational Photography
- Gaining experience through home assignments, practical computer and programming exercises
- Providing a sound solid background knowledge for the Computer Vision courses

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes)
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: English
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: every year, winter semester

Subdivided Module Catalogue for the Subject
Information Systems
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Referred to in LPO I (examination regulations for teaching-degree programmes)
§ 22 II Nr. 3 b)
Module appears in
Master's degree (1 major) Information Systems (2019)
Master's degree (1 major) eXtended Artificial Intelligence (xtAI) (2020)
Master's degree (1 major) Information Systems (2022)
Master's degree (1 major) Computer Science (2023)
Master's degree (1 major) Aerospace Computer Science (2023)
Master's degree (1 major) Artificial Intelligence & Extended Reality (2024)
Master's degree (1 major) Artificial Intelligence (2024)
Master's degree (1 major) Information Systems (2024)
Master's degree (1 major) Information Systems (2025)
Master's degree (1 major) Computer Science (2025)
Master's degree (1 major) Mathematical Data Science (2025)
Master's degree (1 major) Aerospace Computer Science (2025)
First state examination for the teaching degree Gymnasium Computer Science (2025)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Information Retrieval	10-I=IR-242-m01

Module coordinator	Module offered by
holder of the Chair of Computer Science XII	Institute of Computer Science

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

IR models (e. g. Boolean and vector space model, evaluation), processing of text (tokenising, text properties), data structures (e. g. inverted index), query elements (e. g. query operations, relevance feedback, query languages and paradigms, structured queries), search engine (e. g. architecture, crawling, interfaces, link analysis), methods to support IR (e. g. recommendation systems, text clustering and classification, information extraction).

Intended learning outcomes

Students acquire theoretical and practical knowledge in the field of information retrieval and the technical know-how to build a search engine.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: German and/or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Written examination (approx. 60 to 120 minutes)
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits):
IT, KI, HCI, GE

Workload

150 h

Teaching cycle

Teaching cycle: every year, summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

§ 22 II Nr. 3 b)

Module appears in

Master's degree (1 major) Artificial Intelligence (2024)
Master's degree (1 major) Information Systems (2025)
Master's degree (1 major) Computer Science (2025)
First state examination for the teaching degree Gymnasium Computer Science (2025)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Artificial Intelligence 1	10-I=KI1-212-m01

Module coordinator	Module offered by
holder of the Chair of Computer Science VI	Institute of Computer Science

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Intelligent agents, uninformed and heuristic search, constraint problem solving, search with partial information, propositional and predicate logic and inference, knowledge representation.

Intended learning outcomes

The students possess theoretical and practical knowledge about artificial intelligence in the area of agents, search and logic and are able to assess possible applications.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes)
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits):
AT,SE,KI,HCI

Workload

150 h

Teaching cycle

Teaching cycle: every year, winter semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Computer Science (2021)
Master's degree (1 major) Aerospace Computer Science (2021)
Master's degree (1 major) Computational Mathematics (2022)
Master's degree (1 major) Information Systems (2022)
Master's degree (1 major) Mathematics (2022)
Master's degree (1 major) Computer Science (2023)
Master's degree (1 major) Aerospace Computer Science (2023)
Master's degree (1 major) Quantum Engineering (2024)
Master's degree (1 major) Physics International (2024)
Master's degree (1 major) Computational Mathematics (2024)
Master's degree (1 major) Mathematics (2024)

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Master's degree (1 major) Information Systems (2024)

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

Master's degree (1 major) Information Systems (2025)

Master's degree (1 major) Computer Science (2025)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Artificial Intelligence 2	10-I=KI2-212-m01

Module coordinator	Module offered by
holder of the Chair of Computer Science VI	Institute of Computer Science

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Planning, probabilistic closure and Bayesian networks, utility theory and decidability problems, learning from observations, knowledge while learning, neural networks and statistical learning methods, reinforcement learning, processing of natural language.

Intended learning outcomes

The students possess theoretical and practical knowledge about artificial intelligence in the area of probabilistic closure, learning and language processing and are able to assess possible applications.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes)
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT,SE,KI,HCI,GE

Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Computer Science (2021)
Master's degree (1 major) Aerospace Computer Science (2021)
Master's degree (1 major) Computational Mathematics (2022)
Master's degree (1 major) Information Systems (2022)
Master's degree (1 major) Mathematics (2022)
Master's degree (1 major) Computer Science (2023)
Master's degree (1 major) Aerospace Computer Science (2023)
Master's degree (1 major) Computational Mathematics (2024)
Master's degree (1 major) Mathematics (2024)
Master's degree (1 major) Information Systems (2024)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)
Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)
Master's degree (1 major) Information Systems (2025)
Master's degree (1 major) Computer Science (2025)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Machine Learning for Networks 1	10-I=MLN1-232-m01

Module coordinator	Module offered by
holder of the Chair of Computer Science XV	Institute of Computer Science

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Networks matter! This holds for technical infrastructures like communication or transportation networks, for information systems and social media in the World Wide Web, but also for various social, economic and biological systems. What can we learn from data that capture the interaction topology of such complex systems? What is the role of individual nodes and how can we discover significant patterns in the structure of networks? How do these structures influence dynamical process like diffusion or the spreading of epidemics? Which are the most influential actors in a social network? And how can we analyze time series data on systems with dynamic network topologies?

Addressing those questions, the course combines a series of lectures -- which introduce fundamental concepts for the statistical modelling of complex networks -- with weekly exercises that show how we can apply them to practical network analysis tasks. Topics covered include foundations of graph theory, centrality and modularity measures, aggregate statistical characteristics of large networks, random graphs and statistical ensembles of complex networks, generating function analysis of expected graph properties, scale-free networks, stochastic dynamics in networks, spectral analysis, as well as the modelling of time-varying networks. The course material consists of annotated slides for lectures as well as a accompanying git-Repository of jupyter notebooks, which implement and validate the theoretical concepts covered in the lectures. Students can test and deepen their knowledge through weekly exercise sheets. The successful completion of the course requires to pass a final written exam.

Intended learning outcomes

The course will equip participants with statistical network analysis techniques that are needed for the data-driven modelling of complex technical, social, and biological systems. Students will understand how we can quantitatively model the topology of networked systems and how we can detect and characterize topological patterns. Participants will learn how to use analytical methods to make statements about the expected properties of very large networks that are generated based on different stochastic models. They further gain an analytical understanding of how the structure of networks shapes dynamical processes, how statistical fluctuations in degree distributions influence the robustness of systems, and how emergent network features emerge from simple random processes.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes)
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: English
creditable for bonus

Allocation of places

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Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Additional information
Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT,IT,SE,KI,HCI,IN
Workload
150 h
Teaching cycle
Teaching cycle: every year, summer semester
Referred to in LPO I (examination regulations for teaching-degree programmes)
§ 22 II Nr. 3 b)
Module appears in
Master's degree (1 major) Information Systems (2019) Master's degree (1 major) Information Systems (2022) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Artificial Intelligence & Extended Reality (2024) Master's degree (1 major) Artificial Intelligence (2024) Master's degree (1 major) Computational Mathematics (2024) Master's degree (1 major) Mathematics (2024) Master's degree (1 major) Information Systems (2024) Master's degree (1 major) Information Systems (2025) Master's degree (1 major) Computer Science (2025) Master's degree (1 major) Mathematical Data Science (2025) Master's degree (1 major) Aerospace Computer Science (2025) First state examination for the teaching degree Gymnasium Computer Science (2025)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Multilingual NLP	10-I=MNLP-232-m01

Module coordinator	Module offered by
holder of the Chair of Computer Science XII	Institute of Computer Science

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Languages of the world: language families, typology, etymology. Linguistic universals: words, morphology, parts-of-speech, syntax. Alphabets (scripts), encoding, and language identification. Multilingual word representation spaces (aka cross-lingual word embeddings). Transformer architecture and Pretrained (multilingual) Language Models. Machine translation. Multilingual resources: unlabeled corpora, lexico-semantic networks and word translations, parallel corpora. Cross-lingual transfer: from word alignment and label projection, over MT-based transfer to zero-shot and few-shot transfer with multilingual Transformer-based language models. Advanced topics: curse of multilinguality, modularization and language adaptation, multilingual sentence encoders, contextual parameter generation, multi-source transfer, gradient manipulations.

Intended learning outcomes

Students will acquire theoretical and practical knowledge on modern multilingual natural language processing and also get an insight into cutting edge research in (multilingual) NLP. They will learn how to represent texts from different languages in shared representation spaces that enable semantic comparison and cross-lingual transfer for various NLP tasks. Upon successful completion of the course, the students will be well-equipped to solve practical NLP problems regardless of the language of the text data, and to determine the optimal strategy to obtain best performance for any concrete target language.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: German and/or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes)
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: every year, summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

§ 22 II Nr. 3 b)

Module appears in

Master's degree (1 major) Information Systems (2019)
Master's degree (1 major) Information Systems (2022)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Master's degree (1 major) Computer Science (2023)
Master's degree (1 major) Artificial Intelligence (2024)
Master's degree (1 major) Computational Mathematics (2024)
Master's degree (1 major) Management (2024)
Master's degree (1 major) Mathematics (2024)
Master's degree (1 major) Information Systems (2024)
Master's degree (1 major) Economathematics (2024)
Master's degree (1 major) Information Systems (2025)
Master's degree (1 major) Management (2025)
Master's degree (1 major) Computer Science (2025)
Master's degree (1 major) Mathematical Data Science (2025)
Master's degree (1 major) Economathematics (2025)
First state examination for the teaching degree Gymnasium Computer Science (2025)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title		Abbreviation
Machine Learning for Natural Language Processing		10-I=NLP-212-m01

Module coordinator	Module offered by
holder of the Chair of Computer Science X	Institute of Computer Science

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

The lecture conveys advanced knowledge about methods in computational text processing. To this end, it presents state of the art models and techniques in the area of machine learning, as well as their technical background, and their respective applications in Natural Language Processing. As one important building block of almost all modern NLP-models, different techniques for learning representations of words, so called Word Embeddings, are presented. Starting from this we cover, among others, models from the area of Deep Learning, like CNNs, RNNs and Sequence-to-Sequence architectures. The theoretical foundations of these models, like their training with Backpropagation, are also covered in depth. For all models presented in the lecture, we show their application to problems like sentiment analysis, text generation and machine translation in practice.

Intended learning outcomes

The participants have solid knowledge on problems and methods in the area of computational text processing and are able to identify and apply suitable methods for a specific task.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes)
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits):
AT,KI,HCI

Workload

150 h

Teaching cycle

Teaching cycle: every year, summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

§ 22 II Nr. 3 b)

Module appears in

Module studies (Master) Computer Science (2019)
Master's degree (1 major) Computer Science (2021)
Master's degree (1 major) Computational Mathematics (2022)
Master's degree (1 major) Information Systems (2022)
Master's degree (1 major) Mathematics (2022)
Master's degree (1 major) Computer Science (2023)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Master's degree (1 major) Computational Mathematics (2024)
Master's degree (1 major) Management (2024)
Master's degree (1 major) Mathematics (2024)
Master's degree (1 major) Information Systems (2024)
Master's degree (1 major) Economathematics (2024)
Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)
Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)
Master's degree (1 major) Information Systems (2025)
Master's degree (1 major) Management (2025)
Master's degree (1 major) Computer Science (2025)
Master's degree (1 major) Mathematical Data Science (2025)
Master's degree (1 major) Economathematics (2025)
First state examination for the teaching degree Gymnasium Computer Science (2025)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Operations Research	10-I=OR-232-m01

Module coordinator	Module offered by
holder of the Chair of Computer Science I	Institute of Computer Science

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Production plans, railway timetables, the assignment of radio frequencies, planning of delivery tours, or the construction of an 'optimal' university timetable: these problems – and many more – can be modeled as (mixed-) integer linear optimization problems and solved with integer programming methods.
This course teaches integer programming methods like branch-and-bound, cutting plane, and decomposition methods. Furthermore, we practice our modeling skills by studying a variety of application examples.

Intended learning outcomes

After completing the course
- The students are able to model optimization problems as mathematical program (in particular: mixed-integer linear programs).
- The students are able to apply integer programming methods and understand how and why these work.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: German and/or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes)
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): IN

Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

§ 22 II Nr. 3 b)

Module appears in

Master's degree (1 major) Information Systems (2019)
Master's degree (1 major) Information Systems (2022)
Master's degree (1 major) Computer Science (2023)
Master's degree (1 major) Computational Mathematics (2024)
Master's degree (1 major) Management (2024)
Master's degree (1 major) Mathematics (2024)
Master's degree (1 major) Information Systems (2024)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Master's degree (1 major) Economathematics (2024)
Master's degree (1 major) Information Systems (2025)
Master's degree (1 major) Management (2025)
Master's degree (1 major) Computer Science (2025)
Master's degree (1 major) Economathematics (2025)
First state examination for the teaching degree Gymnasium Computer Science (2025)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Professional Project Management	10-I=PM-252-m01

Module coordinator	Module offered by
holder of the Chair of Computer Science III	Institute of Computer Science

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	We recommend completing module 10-I=PRJAK in parallel.

Contents

Project goals, project assignment, project success criteria, business plan, environment analysis and stakeholder management, initialisation, definition, planning, execution/control, finishing of projects, reporting, project communication and marketing, project organisation, team building and development, opportunity and risk management; conflict and crisis management, change and claim management; contract and procurement management, quality management, work techniques, methods and tools; leadership and social skills in project management, program management, multiproject management, project portfolio management, PMOs; peculiarities of software projects; agile project management/SCRUM, combination of classic and agile methods.

Intended learning outcomes

The students possess practically relevant knowledge about the topics of production management and/or professional project management. They are familiar with the critical success criteria and are able to initiate, define, plan, control and review projects.

Courses (type, number of weekly contact hours, language — if other than German)

V (4)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes)
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): SE, IT, KI, ES, LR, HCI, GE, IN

Workload

150 h

Teaching cycle

Teaching cycle: every year, summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

§ 22 II Nr. 3 b)

Module appears in

Supplementary course Supplementary course Entrepreneurship into Action (ZENTRIA) (2025)
Master's degree (1 major) Information Systems (2025)
Master's degree (1 major) Management (2025)
Master's degree (1 major) Computer Science (2025)
Master's degree (1 major) Economathematics (2025)
First state examination for the teaching degree Gymnasium Computer Science (2025)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Programming with neural nets	10-I=PNN-252-m01

Module coordinator	Module offered by
Dean of Studies Informatik (Computer Science)	Institute of Computer Science

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Overview over NN, implementation of important NN-architectures like FCN, CNN and LSTMs, practical example for NN-architectures, among others in the area of image and language processing.

Intended learning outcomes

Knowledge about possible applications and limitations of NN, for important architectures (eg. FCN, CNN, LSTM) and how they are implemented in NN-tools like Tensorflow/Keras, ability to program network structures from literature, to prepare data and solve concrete tasks for NN.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes)
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): SE, IT, KI, HCI, GE, IN

Workload

150 h

Teaching cycle

Teaching cycle: every year, summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Information Systems (2025)
Master's degree (1 major) Computer Science (2025)
Master's degree (1 major) Mathematical Data Science (2025)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Project - Current Topics in Computer Science	10-I=PRJAK-252-m01

Module coordinator	Module offered by
Dean of Studies Informatik (Computer Science)	Institute of Computer Science

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Completion of a project task (in Teams).

Intended learning outcomes

The project allows participants to work on a problem in computer science in teams.

Courses (type, number of weekly contact hours, language — if other than German)

P (4)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

project report (10 to 15 pages) and presentation of project (15 to 30 minutes)
Language of assessment: German and/or English
Assessment offered: In the semester in which the course is offered (Each project is offered one time only. The project will not be repeated; there will not be another project with the same topic. Assessment can, therefore, only be offered for the project offered in the respective semester)

Allocation of places

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Additional information

Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT, SE, IT, KI, ES, LR, HCI, GE, SEC, IN

Workload

150 h

Teaching cycle

Teaching cycle: every semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Supplementary course Supplementary course Entrepreneurship into Action (ZENTRIA) (2025)
Master's degree (1 major) Information Systems (2025)
Master's degree (1 major) Management (2025)
Master's degree (1 major) Computer Science (2025)
Master's degree (1 major) Economathematics (2025)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Software Architecture	10-I=SAR-161-m01

Module coordinator	Module offered by
holder of the Chair of Computer Science II	Institute of Computer Science

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Introduction to software architecture, architectural styles and patterns, software metrics, evaluation of architectural styles, software components, interface models and design guidelines, design-by-contract, component-based software engineering, service-oriented architectures, microservice architectures, scalability of databases, cloud-native and serverless computing, continuous integration, continuous delivery, continuous deployment, model-driven architecture

Intended learning outcomes

The students possess a fundamental and applicable knowledge about advanced topics in software engineering with a focus on modern software architectures and fundamental approaches to model-driven software engineering.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes).
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits):
SE,IT,ES

Workload

150 h

Teaching cycle

Teaching cycle: every year, summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

§ 22 II Nr. 3 b)

Module appears in

Master's degree (1 major) Computer Science (2016)
Master's degree (1 major) Mathematics (2016)
Master's degree (1 major) Computational Mathematics (2016)
Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)
Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)
Master's degree (1 major) Computer Science (2017)
Master's degree (1 major) Computer Science (2018)
Module studies (Master) Computer Science (2019)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Master's degree (1 major) Computational Mathematics (2019)
Master's degree (1 major) Mathematics (2019)
Master's degree (1 major) Information Systems (2019)
Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)
Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)
Master's degree (1 major) Computer Science (2021)
Master's degree (1 major) Computational Mathematics (2022)
Master's degree (1 major) Information Systems (2022)
Master's degree (1 major) Mathematics (2022)
Master's degree (1 major) Computer Science (2023)
Master's degree (1 major) Computational Mathematics (2024)
Master's degree (1 major) Management (2024)
Master's degree (1 major) Mathematics (2024)
Master's degree (1 major) Information Systems (2024)
Master's degree (1 major) Economathematics (2024)
Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)
Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)
Master's degree (1 major) Information Systems (2025)
Master's degree (1 major) Management (2025)
Master's degree (1 major) Computer Science (2025)
Master's degree (1 major) Economathematics (2025)
First state examination for the teaching degree Gymnasium Computer Science (2025)

	Subdivided Module Catalogue for the Subject
UNIVERSITÄT WÜRZBURG	Information Systems
	Master's with 1 major, 120 ECTS credits

Module title		Abbreviation
Systems Benchmarking		10-I=SB-252-m01

Module coordinator	Module offered by
holder of the Chair of Computer Science II	Institute of Computer Science

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Benchmarking has become a major discipline in science and technology as a driver of product quality, efficiency, and sustainability. Reliable and fair benchmarks enable educated decisions and play an important role as evaluation tools during system design, development, and maintenance. In research, benchmarks play an integral part in the evaluation and validation of new approaches and methodologies. The course introduces the foundations of benchmarking as a discipline, covering the three fundamental elements of each benchmarking approach: metrics, workloads, and measurement methodology. More specifically the following topics are covered: benchmarking basics, metrics, statistical measurements, experimental design, workloads, measurement tools, operational analysis, basic queueing models, and benchmark standardization. Furthermore, the course covers selected application areas and case studies, such as benchmarking of energy efficiency, virtualization, storage, microservices, cloud elasticity, performance isolation, resource demand estimation, and software and system security.

Intended learning outcomes

Students are able to design and build fair and reliable benchmarks, metrics, and measurement tools. Students can evaluate the quality of existing benchmarking approaches and benchmark results.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes)
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): SE, IT, ES, HCI, GE, IN

Workload

150 h

Teaching cycle

Teaching cycle: every year, summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

§ 22 II Nr. 3 b)

Module appears in

Master's degree (1 major) Information Systems (2025)
Master's degree (1 major) Computer Science (2025)
Master's degree (1 major) Aerospace Computer Science (2025)
First state examination for the teaching degree Gymnasium Computer Science (2025)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Statistical Network Analysis	10-I=SNA-232-m01

Module coordinator	Module offered by
holder of the Chair of Computer Science XV	Institute of Computer Science

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Networks matter! This holds for technical infrastructures like communication or transportation networks, for information systems and social media in the World Wide Web, but also for various social, economic and biological systems. What can we learn from data that capture the interaction topology of such complex systems? What is the role of individual nodes and how can we discover significant patterns in the structure of networks? How do these structures influence dynamical process like diffusion or the spreading of epidemics? Which are the most influential actors in a social network? And how can we analyze time series data on systems with dynamic network topologies?

Addressing those questions, the course combines a series of lectures -- which introduce fundamental concepts for the statistical modelling of complex networks -- with weekly exercises that show how we can apply them to practical network analysis tasks. Topics covered include foundations of graph theory, centrality and modularity measures, aggregate statistical characteristics of large networks, random graphs and statistical ensembles of complex networks, generating function analysis of expected graph properties, scale-free networks, stochastic dynamics in networks, spectral analysis, as well as the modelling of time-varying networks. The course material consists of annotated slides for lectures as well as a accompanying git-Repository of jupyter notebooks, which implement and validate the theoretical concepts covered in the lectures. Students can test and deepen their knowledge through weekly exercise sheets. The successful completion of the course requires to pass a final written exam.

Intended learning outcomes

The course will equip participants with statistical network analysis techniques that are needed for the data-driven modelling of complex technical, social, and biological systems. Students will understand how we can quantitatively model the topology of networked systems and how we can detect and characterize topological patterns. Participants will learn how to use analytical methods to make statements about the expected properties of very large networks that are generated based on different stochastic models. They further gain an analytical understanding of how the structure of networks shapes dynamical processes, how statistical fluctuations in degree distributions influence the robustness of systems, and how emergent network features emerge from simple random processes.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes).
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: English
creditable for bonus

Allocation of places

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Additional information

Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): IN

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Workload
150 h
Teaching cycle
Teaching cycle: every year, winter semester
Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
Master's degree (1 major) Information Systems (2019) Master's degree (1 major) Information Systems (2022) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Aerospace Computer Science (2023) Master's degree (1 major) Computational Mathematics (2024) Master's degree (1 major) Management (2024) Master's degree (1 major) Mathematics (2024) Master's degree (1 major) Information Systems (2024) Master's degree (1 major) Economathematics (2024) Master's degree (1 major) Information Systems (2025) Master's degree (1 major) Management (2025) Master's degree (1 major) Computer Science (2025) Master's degree (1 major) Mathematical Data Science (2025) Master's degree (1 major) Economathematics (2025) Master's degree (1 major) Aerospace Computer Science (2025)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Security of Software Systems	10-I=SSS-232-m01

Module coordinator	Module offered by
holder of the Chair of Computer Science II	Institute of Computer Science

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

The lecture provides an overview of common software vulnerabilities, state-of-the-art attack techniques on modern computer systems, as well as the measures implemented to protect against these attacks. In the course, the following topics are discussed:
- x86-64 instruction set architecture and assembly language
- Runtime attacks (code injection, code reuse, defenses)
- Web security
- Blockchains and smart contracts
- Side-channel attacks
- Hardware security

Intended learning outcomes

Students gain a deep understanding of software security, from hardware and low-level attacks to modern concepts such as blockchains. The lecture prepares for research in the area of security and privacy, while the exercises allow students to gain hands-on experience with attacks and analysis of systems from an attacker's perspective.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes)
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: English
creditable for bonus

Allocation of places

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Additional information

Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits):
SE,KI,LR, HCI, ES, SEC,IN

Workload

150 h

Teaching cycle

Teaching cycle: every year, summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

§ 22 II Nr. 3 b)

Module appears in

Module studies (Master) Computer Science (2019)
Master's degree (1 major) Computer Science (2023)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Master's degree (1 major) Artificial Intelligence & Extended Reality (2024)

Master's degree (1 major) Artificial Intelligence (2024)

Master's degree (1 major) Computational Mathematics (2024)

Master's degree (1 major) Mathematics (2024)

Master's degree (1 major) Information Systems (2024)

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

Master's degree (1 major) Information Systems (2025)

Master's degree (1 major) Computer Science (2025)

Master's degree (1 major) Aerospace Computer Science (2025)

First state examination for the teaching degree Gymnasium Computer Science (2025)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title		Abbreviation
Discrete Event Simulation		10-I=ST-232-m01

Module coordinator	Module offered by
holder of the Chair of Computer Science III	Institute of Computer Science

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

The simulation of communication systems is illustrated and practically performed on contemporary examples, e.g., popular Internet services or the Internet of Things (IoT). The following topics will be conveyed: Introduction to simulation techniques, discrete-event simulation and process-oriented simulation, generating random numbers and random variables, statistical analysis of simulation results, evaluation of measured data, designing and evaluating simulation experiments, special random processes, possibilities and limitations of modelling and simulation, advanced concepts and techniques, practical execution of simulation projects.

Intended learning outcomes

The students possess the methodic knowledge and the practical skills necessary for the stochastic simulation of (technical) systems, the evaluation of results and the correct assessment of the possibilities and limits of simulation methods.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes)
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits):
IT,KI,ES,GE,IN

Workload

150 h

Teaching cycle

Teaching cycle: every year, summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

§ 22 II Nr. 3 b)

Module appears in

Module studies (Master) Computer Science (2019)
Master's degree (1 major) Computer Science (2023)
Master's degree (1 major) Aerospace Computer Science (2023)
Master's degree (1 major) Artificial Intelligence & Extended Reality (2024)
Master's degree (1 major) Artificial Intelligence (2024)
Master's degree (1 major) Computational Mathematics (2024)
Master's degree (1 major) Mathematics (2024)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Master's degree (1 major) Information Systems (2024)

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

Master's degree (1 major) Information Systems (2025)

Master's degree (1 major) Computer Science (2025)

Master's degree (1 major) Aerospace Computer Science (2025)

First state examination for the teaching degree Gymnasium Computer Science (2025)

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title		Abbreviation
Advanced Operations & Logistics Management		12-M-AOLM-262-m01

Module coordinator	Module offered by
holder of the Chair of Logistics and Quantitative Methods	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

The course "Advanced Operations & Logistics Management" acquaints students with advanced methods for the planning of integrated production and logistics systems and demonstrates the application of these with the help of multiple case studies.

Intended learning outcomes

After completing this course students can
(i) analyze and evaluate integrated production and logistics systems;
(ii) develop and apply appropriate methods to plan complex production and logistics systems;
(iii) evaluate the consequences of uncertainties in processes, and
(iv) apply concepts and methods to plan uncertainties processes.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: English
creditable for bonus

Allocation of places

--

Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Practical Data Science	12-M-ATDS-262-m01

Module coordinator	Module offered by
holder of the Chair of Business Informatics and AI for Enterprise	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

In this course, students work on advanced data science projects. The course covers the entire data science workflow from data collection to data preparation to modeling, evaluation and deployment. By following a top-down teaching approach, students are enabled to apply complex machine learning models from the beginning.

Intended learning outcomes

As part of the course work, students will acquire knowledge and skills in the following areas:
1. Becoming familiar with the principles and frameworks in the research area of Data Science.
2. Apply machine learning and deep learning frameworks to structured and unstructured data
3. Design, implementation and evaluation of key algorithms within an end-to-end workflow in the field of Data Science
4. Application of Jupyter notebooks and their infrastructure (collection, storage, retrieval, and analysis of data)
5. Understanding of a data-driven & analytical approach to decision problems

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: English
Assessment offered: In the semester in which the course is offered
creditable for bonus

Allocation of places

Number of places: 35.
WA:
Should the number of applications exceed the number of available places, places will be allocated as follows:
(1) Students who already have successfully completed courses offered by the supervising chair will be given preferential consideration.
a. Among applicants with the same number of successfully completed modules, places will be allocated according to the total number of ECTS credits achieved in the corresponding modules.
b. When places are allocated in accordance with b) and the number of applications exceeds the number of available places, places will be allocated according to the average grade of assessments taken in the corresponding courses.
c. Among applicants with the same average grade, places will be allocated by lot.
(2) Any remaining places are available to students who have not yet successfully completed any courses of the supervising chair. The selection is made according to study progress (number of semesters); among applicants with the same number of semesters, places will be allocated by lot. A waiting list will be maintained and places re-allocated as they become available.

Additional information

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Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Workload
150 h
Teaching cycle
Teaching cycle: no courses offered
Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title		Abbreviation
Analytical Information Systems		12-M-BI-262-m01

Module coordinator	Module offered by
holder of the Chair of Business Analytics	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

The course provides a comprehensive introduction to data management, statistical methods, and machine learning. The module covers topics such as SQL, data integration, streaming data, and various learning methods in artificial intelligence, including neural networks.

Intended learning outcomes

- Understand data management, including data entry, annotation, and manipulation.
- Learn general statistical techniques for data inspection, exploration, and analysis.
- Effectively use machine learning approaches to perform predictive analytics.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: English
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title			Abbreviation	
Decision Support Systems			12-M-DSS-262-m01	

Module coordinator		Module offered by	
holder of the Chair of Business Analytics		Faculty of Management and Economics	

ECTS	Method of grading	Only after succ. compl. of module(s)	
5	numerical grade	--	

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

The course discusses advanced approaches for modelling and solving decision problems in business settings. The acquired insights are used to design and implement decision support systems using standard software tools (Python).

Intended learning outcomes

After successfully completing the course, students should be able to
- Understand the structure of classic business decision problems
- Isolate key elements from general problem descriptions and convert them to quantitative decision models
- Solve different classes of optimization problems (linear, integer, non-linear, stochastic, dynamic)
- Implement decision support systems

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: English
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: winter semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Enterprise AI	12-M-EAI-262-m01

Module coordinator	Module offered by
holder of the Chair of Business Informatics and AI for Enterprise	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Introduction to Enterprise AI
Business Requirements for AI Systems
ML Ops I: Data Engineering
ML Ops II: Obtaining Training Data
ML Ops III: Data Preprocessing
ML Ops IV: Feature Engineering
ML Ops V: Modeling & Evaluation
ML Ops VI: Deployment
ML Ops VII: System Monitoring
ML Ops VIII: Updating in Production
Instrastructure and Tools
Managing Machine Learning Teams

Intended learning outcomes

In this course, you will learn the fundamentals for developing, deploying and maintaining machine learning systems in companies (MLOps). This includes an understanding of the associated IT infrastructure as well as staffing and organizational forms for managing machine learning and data science teams.

You will refine and test your skills by practicing the theoretical concepts during exercise sessions. This includes a team project, where you and your peers will develop and deploy your own machine learning system.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: English
Assessment offered: In the semester in which the course is offered
creditable for bonus

Allocation of places

--

Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module appears in	
keinem Studiengang zugeordnet	

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title			Abbreviation
E-Commerce			12-M-EC1-262-m01

Module coordinator		Module offered by
holder of the Chair of Business Administration and Marketing		Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)	
5	numerical grade	--	

Duration	Module level	Other prerequisites	
1 semester	graduate	--	

Contents

E-commerce is a highly relevant field for almost all types of companies. However, the ecommerce approaches and strategies applied by companies differ strongly depending on the respective firm context (e.g., in terms of industry, types of customers, types of products). In this seminar, students analyze the specific e-commerce strategy of a selected firm. In doing so, they evaluate the strategies' current and future potential and make suggestions for improvements and for addressing future trends. Furthermore, each lecture session will contain short presentations where the students (in groups) will either apply selected lecture topics to real-world business cases or present the core aspects of research articles dealing with e-commerce topics in general.

Intended learning outcomes

This class enables students to gain insights into real-life e-commerce strategies and to train their abilities in assessing business strategies.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: English
creditable for bonus

Allocation of places

Number of places: 15.
WA:
Should the number of applications exceed the number of available places, places will be allocated as follows:
(1) Students who already have successfully completed courses offered by the supervising chair will be given preferential consideration.
a. Among applicants with the same number of successfully completed modules, places will be allocated according to the total number of ECTS credits achieved in the corresponding modules.
b. When places are allocated in accordance with b) and the number of applications exceeds the number of available places, places will be allocated according to the average grade of assessments taken in the corresponding courses.
c. Among applicants with the same average grade, places will be allocated by lot.
(2) Any remaining places are available to students who have not yet successfully completed any courses of the supervising chair. The selection is made according to study progress (number of semesters); among applicants with the same number of semesters, places will be allocated by lot. A waiting list will be maintained and places re-allocated as they become available.

Additional information

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Workload

150 h

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Teaching cycle
Teaching cycle: summer semester
Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title		Abbreviation
Experimental Economics		12-M-EE-262-m01

Module coordinator		Module offered by
holder of the Chair of Labour Economics		Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Aim and outline of the course:

The Nobel Prizes for Daniel Kahneman and Vernon Smith 2002 and for Richard Thaler 2017 have underlined the increasing importance of experimental methods in economics. Experimental methods are used to collect data using randomization or a highly controlled environment. This course offers an introduction to the methodology of experimental economics and economic laboratory experiments.

In the methodology part it is shown why experiments are a good tool to generate scientific knowledge. Furthermore, widely used techniques in economic experiments are explained and how economic experiments differ from experiments in other social sciences. This part also deals with methods of reasoning, i.e. how inferences can be drawn from evidence that is generated by experiments.

The unifying theme of all laboratory experiments that will be covered is, understanding the behavior of agents, who produce and/or distribute goods by interacting with each other. The first topic is about markets and it includes experiments that shown under which conditions and institutions markets work very efficient and under which conditions and institutions they fail to yield a desirable outcome. The second topic includes experiments that look at the behavior of two agents, who bargain about the distribution of a common pie. On the basis of these results we will discuss experiments that try to explain bargaining behavior and show how agents deviate systematically from the neoclassical framework, i.e. the "homo oeconomicus". The third topic deals with cooperation and institutions that support cooperation in the long run as equilibrium. Further, systematic evidence will be presented on how individuals can be classified in different cooperative types and how these types can explain economic outcomes in natural environments. The forth topic concerns reciprocity, a strong determining factor of human behavior that is nearly universal. We will cover experiments that show how reciprocity can enforce relational contracts in the absence of third party enforcement. Moreover, there will be a special emphasis on how reciprocity affects labor markets.

When time permits up to two additional topics will be covered. The first topic is about gender differences in competitiveness, risk-aversion and overconfidence. The second topic is about the elicitation of social norms.

Prerequisites: Participants should have a basic knowledge about microeconomics, game theory and econometrics.

Literature:

The course will be mainly paper based but the following books provide a good overview and complement the discussed papers.

- Dhami, S. (2016). The Foundations of Behavioral Economic Analysis. Oxford University Press.
- Guala, F. (2005). The Methodology of Experimental Economics. Cambridge University Press

In addition lecture slides will be provided.

Intended learning outcomes

The aim of the course is to familiarize students with the methodology experimental economics. Further, students will be enabled to understand how causal evidence can be obtained using controlled variation and how to generalize from results that are derived in artificial laboratory setting to more natural environments. Moreover, the

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

course shall deepen students' understanding of human decision making in multi-agent settings and to make them aware of systematic heterogeneous human behavior in the production and distribution of goods.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours)
Language of assessment: English
Assessment offered: In the semester in which the course is offered
creditable for bonus

Allocation of places

30 places.
WA1:
(1) Should the number of applications exceed the number of available places, places will be allocated by lot among all applicants irrespective of their subjects. (2) Places on all courses of the module with a restricted number of places will be allocated in the same procedure. (3) A waiting list will be maintained and places re-allocated by lot as they become available.

Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: after announcement

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet

Julius-Maximilians-
UNIVERSITÄT
WÜRZBURG

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Business Software 2: Data-driven Business Process Management and Automation	12-M-ERP-262-m01

Module coordinator	Module offered by
holder of the Chair of Business Management and Business Information Systems	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

The course comprises four main parts:
- Business Process Management
- Modern Data Management
- Process Mining
- Process Automation

In addition to the lectures, students have the opportunity to engage with fundamental research papers on Business Process Management and gain practical experience by solving a case study based on real event logs.

Intended learning outcomes

The module "Business Software 2: Data-driven Business Process Management and Automation" aims to achieve the following learning outcomes:

1. Understanding of Business Process Management: Upon completion of the course, students will be able to articulate the fundamental theories and practical methodologies of Business Process Management. This includes the ability to analyze, redesign, and implement improved business processes both manually and using automated tools.
2. Application of Modern Data Management Techniques: Students will acquire competencies in modern data management practices that are essential for real-time decision-making in business contexts.
3. Conducting Process Mining: Students will develop skills in process mining, enabling them to extract data from event logs and analyze this information to uncover inefficiencies and opportunities within business processes. They will learn to apply process mining tools and techniques to real datasets, interpret results, and propose actionable improvements.
4. Implementation of Process Automation Solutions: The course equips students with the knowledge and skills to automate business processes using industry-standard automation software such as UiPath. Students will learn to identify suitable processes for automation, design automation workflows, and implement these systems to enhance operational efficiency.
5. Engagement in Scientific Research and Practical Application: Students will expand their academic and practical understanding by engaging with fundamental research papers in the field of Business Process Management. They will also gain practical experience through case studies and hands-on projects, allowing them to effectively apply theoretical knowledge to solve real-world problems.
6. Development of Professional Competencies: Throughout the course, students will develop a range of professional skills, including critical thinking, problem-solving, teamwork, and effective communication. These competencies are crucial for successful career development in Business Process Management and related fields.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: German and/or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: German and/or English
creditable for bonus

Allocation of places
50 places. WM1: Should the number of applications exceed the number of available places, places will be allocated as follows: 1) Master's students of Information Systems, Management and Economathematics will be given preferential consideration. (2) The remaining places will be allocated to students of other subjects. (3) When places are allocated in accordance with (1) and (2) and the number of applications exceeds the number of available places, places will be allocated by lot among applicants from this group.
Additional information
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Workload
150 h
Teaching cycle
Teaching cycle: summer semester
Referred to in LPO I (examination regulations for teaching-degree programmes)
--
Module appears in
keinem Studiengang zugeordnet

Julius-Maximilians-
UNIVERSITÄT
WÜRZBURG

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title			Abbreviation
Entrepreneurship in Software-Ecosystems: Start & Scale Up, Venture Capital, Private Equity, EXIT			12-M-ESE-262-m01

Module coordinator		Module offered by
holder of the Chair of Business Management and Business Information Systems		Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

This module is aimed at students of Wirtschaftsinformatik (Business Information Systems) and Wirtschaftswissenschaft (Business Management and Economics) who are interested in enterprise thinking, scaling, and software entrepreneurship. Therefore, this module focuses on the intersection of entrepreneurship, software ecosystems, and scale-up companies.

The module first provides a foundation for understanding entrepreneurship from a theoretical perspective. It covers value management, business model development, and organizational structures. This is followed by a deeper insight into the various aspects of practical business management, including daily doing, sales, financing, traction, KPIs measuring success and performance, and legal forms.

The main part of this module discusses how software-based companies can position themselves in the market and generate value through different business models and innovative strategies. Students will learn about the ecosystems of digital companies and the composition of their strategies. These strategies form the foundation for the growth of young companies, especially scale-ups. The module provides theoretical overviews, practical tools, and instruments for developing growth strategies. Various financing and exit strategies are also covered.

This module includes the following course contents, as summarized below:
- Introduction to Entrepreneurship, Digital Startup Ecosystems, and Process Models
- Value Management and Business Model Development
- Daily Doing, KPI, Traction and Project-Management
- Software Entrepreneurship: Software-based Value Chain
- Scale-Ups: Introduction, Growth, Tools and Strategies
- Exit Strategies

Intended learning outcomes

The "Entrepreneurship in Software-Ecosystems: Start & Scale Up, Venture Capital, Private Equity, EXIT" module aims to achieve the following learning outcomes:
1. Software-Based Business Models: Students will learn to understand software-based business models, manage daily operations, maintain traction, and implement KPI management.
2. Software Entrepreneurship: After completing the module, students will be able to define software entrepreneurship, analyze its ecosystems, and engage with value-enhancing strategies.
3. Corporate Structures and Growth: Participants will learn to build scalable structures, develop growth strategies, and practically apply scaling tools.
4. Exit Strategies: Students will become familiar with various exit strategies for businesses and assess their advantages and disadvantages.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: German and/or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: German and/or English

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

creditable for bonus

Allocation of places

50 places (max. 10 places will be allocated to students of the supplementary course ZENTRIA)
WA:
Should the number of applications exceed the number of available places, places will be allocated as follows:
(1) Students who already have successfully completed courses offered by the supervising chair will be given preferential consideration.
a. Among applicants with the same number of successfully completed modules, places will be allocated according to the total number of ECTS credits achieved in the corresponding modules.
b. When places are allocated in accordance with b) and the number of applications exceeds the number of available places, places will be allocated according to the average grade of assessments taken in the corresponding courses.
c. Among applicants with the same average grade, places will be allocated by lot.
(2) Any remaining places are available to students who have not yet successfully completed any courses of the supervising chair. The selection is made according to study progress (number of semesters); among applicants with the same number of semesters, places will be allocated by lot. A waiting list will be maintained and places re-allocated as they become available.

Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Global Logistics & Supply Chain Management	12-M-GLSC-262-m01

Module coordinator	Module offered by
holder of the Chair of Logistics and Quantitative Methods	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

The course "Global Logistics & Supply Chain Management" acquaints students with advanced methods for the planning of global production networks and demonstrates the application of these with the help of multiple case studies.

Intended learning outcomes

After completing this course students can
(i) analyze and evaluate global production networks;
(ii) develop and apply appropriate methods to plan production networks;
(iii) evaluate the consequences of uncertainties in processes and apply concepts and methods to plan uncertain processes.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: English
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: winter semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title			Abbreviation
Business Software 1: Management and Implementation of Information Systems			12-M-GPU-262-m01

Module coordinator		Module offered by	
holder of the Chair of Business Management and Business Information Systems		Faculty of Management and Economics	

ECTS	Method of grading	Only after succ. compl. of module(s)	
5	numerical grade	--	

Duration	Module level	Other prerequisites	
1 semester	graduate	--	

Contents

The module offers a comprehensive insight into the world of Enterprise Resource Planning (ERP) systems. ERP systems are central building blocks in modern business management and play a crucial role in the integration of business processes, data management and decision-making. This module is divided into three sections, each of which focuses on practical applications and examples in addition to theory.

- Section 1: ERP selection process with application examples of two ERP systems: The first part of the module is dedicated to the complex process of selecting a suitable ERP system for a company. Students are familiarized with proven methods and tools that are used in the evaluation of ERP systems. Using case studies, students compare two different ERP systems and apply the selection process in a real-life environment.
- Section 2: Low-code and no-code systems with application examples: In this part, students are familiarized with low-code and no-code platforms that enable the efficient development of individual ERP applications. The focus is on dealing with a specific software solution from a leading company in this field. Students learn the basics of these platforms and create their own applications in order to experience the advantages of low-code and no-code approaches in practice.
- Section 3: Customizing ERP software using the example of SAP S/4HANA: In the final part, students learn the basics of customizing ERP software. The focus is on the world's leading ERP system SAP S/4HANA. Students are enabled to adapt SAP S/4HANA to the specific requirements of a company. Practical exercises and case studies enable students to apply customizing techniques in real-life scenarios.

In addition to the theoretical information presented in the lecture, the exercises offer the opportunity to access the ERP systems and deal with the respective software in a practical way by means of extensive case studies.

Intended learning outcomes

The "Business Software 1: Management and Implementation of Information Systems" module aims to achieve the following learning outcomes:

1. ERP Systems - Overview and Differentiation: Students gain a comprehensive understanding of various ERP systems, their architectures, and philosophies.
2. Integration of Business Processes: Participants learn how ERP systems map and optimize business operations.
3. Selection and Customizing of ERP Systems: Students develop skills to evaluate, select, and adapt ERP systems to meet business needs.
4. Implementation of Business Processes: Students gain practical experience in independently implementing business processes in ERP and low-code/no-code platforms, and learn practical ERP customizing.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: German and/or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: German and/or English
creditable for bonus

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Allocation of places
50 places. WM1: Should the number of applications exceed the number of available places, places will be allocated as follows: 1) Master's students of Information Systems, Management and Economathematics will be given preferential consideration. (2) The remaining places will be allocated to students of other subjects. (3) When places are allocated in accordance with (1) and (2) and the number of applications exceeds the number of available places, places will be allocated by lot among applicants from this group.

Additional information
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Workload
150 h

Teaching cycle
Teaching cycle: winter semester

Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title		Abbreviation
Human Resource Management and Industrial Relations		12-M-HRM-262-m01

Module coordinator	Module offered by
holder of the Chair for Human Resource Management and Organisation	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

The lecture "Human Resource Management and Industrial Relations" introduces advanced theories, estimation techniques and empirical results from the areas of human resources management and institutional frameworks such as ithe different actors in ndustrial relations.

Syllabus
Introduction: Human Resource Management & Industrial Relations
Chapter 1: The employment contract
Chapter 2: Motivation
Chapter 3: Employee resistance against reorganisations
Chapter 4: The role of works councils
Chapter 5: Works councils and the employer wage structure
Chapter 6: The behaviour of labour unions
Chapter 7: Credentials and signaling
Chapter 8: Demographic challenges of HRM

Literature
Milgrom, Roberts (1992), Economics, Organization and Management, Prentice Hall, Englewood Cliffs
Picot, Dietl, Franck, Fiedler, Royer (2015), Organisation – Theorie und Praxis aus ökonomischer Sicht, 7. Auflage, Schäffer Poeschel, Stuttgart
Zwick (2003), Empirische Determinanten des Widerstandes von Mitarbeitern gegen Innovationen, Schmalenbachs Zeitschrift für betriebswirtschaftliche Forschung 55, 45-59
Freeman, Lazear (1995), An Economic Analysis of Works Councils, in Rogers, Streeck (eds.), Works Councils, Chicago, 27-50
Addison, Teixeira, Zwick (2010), Works Councils and the Anatomy of Wages, Industrial and Labor Relations Review 63 (2), 240-273
Atherton (1973), Theory of Union Bargaining Goals, Princeton University Press, Princeton, NJ.
Garibaldi (2006), Personnel Economics in Imperfect Labour Market, Oxford University Press, Oxford (chapter 6).
Mohrenweiser, Wydra-Somaggio, Zwick (2020), Information advantages of training employers despite credible training certificates, Oxford Economic Papers 72(3), 651-671.
Malmberg, Lindh, Halversson (2008), Productivity consequences of workforce aging: Stagnation or Horndal effect. In Prskawetz, Bloom, Lutz (eds.), Population and Development Review, Population Ageing, Human Capital Accumulation, and Productivity Growth (suppl. to Vol. 34), 238-256

Intended learning outcomes

The aim of the lectures is to enable students to understand and apply advanced theories, estimation techniques and empirical results in the area human resource management and industrial relations on the basis of scientific literature.
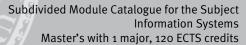
Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

b) portfolio (approx. 50 hours total)
Language of assessment: English
creditable for bonus

Allocation of places
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Additional information
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Workload
150 h
Teaching cycle
Teaching cycle: summer semester
Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title		Abbreviation
Digital Strategy		12-M-IBS-262-m01

Module coordinator	Module offered by
holder of the Chair of Information Systems Engineering	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

The module provides an overview of strategic implications of digital technologies at the level of organisations, industries and value networks. To this end, concepts and frameworks from strategic technology management are applied to digital innovations and illustrated with numerous examples. In the accompanying exercise, case studies of well-known digital companies and their business models are analysed and discussed.

Intended learning outcomes

- Become familiar with theoretical concepts of strategy development and implementation in the e-business context
- Understand the strengths and weaknesses of different frameworks and approaches as well as the prerequisites for their meaningful application
- Apply the concepts to case studies and derive action-oriented recommendations from them
- Learn how to transfer the concepts to other entrepreneurial situations from their studies or work

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: English
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: winter semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title			Abbreviation
Strategic Managerial Accounting			12-M-INST-262-m01

Module coordinator		Module offered by
holder of the Chair of Business Management, Controlling and Accounting		Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

The module focuses on accounting instruments, which are applied in the context of strategic management of enterprises. First, it addresses important drivers of strategic decisions from a microeconomic perspective, such as the emergence of cost and quality advantages in competition as well as scale and experience curve effects. Second, the module covers analytical and heuristic techniques of planning and control. In the context of these techniques, instruments of target costing, life cycle cost analysis, benchmarking and business wargaming are discussed with regard to their theoretical foundation and fields of application.

Intended learning outcomes

Initially, students acquire an understanding of economic drivers of strategic decisions as well as fundamental requirements concerning instruments of decision-making and behavior control in enterprises. Upon completion of the course, they are able to analyze and evaluate the strengths and weaknesses, as well as fields of application and limitations, of prevalent instruments of strategic corporate management used in practice. Additionally, they develop competences in the design and further development of strategic instruments.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: German and/or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Information Systems	12-M-IS-262-m01

Module coordinator	Module offered by
holder of the Chair of Information Systems Engineering	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

The course provides an overview of key strategic and operational aspects of the management of information and information systems in organizations. The focus is on (a) enterprise systems, (b) e-business, (c) business analytics and (d) enterprise AI.

Intended learning outcomes

- Understanding the value of information and information systems from a business perspective
- Be able to evaluate strategic and operational use cases for IT in the company
- Get to know methods for the management and utilization of data
- Be able to transfer the concepts taught to practical application examples

Courses (type, number of weekly contact hours, language — if other than German)

V (4)
Module taught in: German and/or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: each semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Marketing Analytics	12-M-MA-262-m01

Module coordinator	Module offered by
holder of the Junior Professorship of Marketing Analytics	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Marketing analytics involves the collection, management, and analysis of data to gain insights into the performance of marketing activities. In fact, it is increasingly possible to use data analysis to inform, make, and even automate marketing decisions. The goal of this course is to provide students with a hands-on understanding of key methods and specific techniques used in marketing analytics. This requires substantive knowledge in marketing as well as of fundamental ideas at the intersection of statistics, economics, psychology, and computer science.

The course will cover fundamentals of data science, including data wrangling and data exploration, and will then turn to applied, real-world marketing analytics problems such as marketing mix modeling, market segmentation, and measuring preferences and demand. Emphasis will be placed on data visualization and valuable methods for causal inference in marketing. The course will also delve into a few advanced marketing topics. To provide a hands-on learning experience, the course will include practical applications of the covered content using the R programming language.

Intended learning outcomes

- Understand key methods and techniques used in marketing analytics and how to apply them to real-world problems.
- Learn to identify the appropriate analytical methods to use for specific marketing problems.
- Develop proficiency in data wrangling and data exploration techniques.
- Develop skills in data visualization and interpretation to effectively communicate marketing insights.
- Gain hands-on experience with the R programming language and apply it to solving marketing analytics problems.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: English
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module appears in	
keinem Studiengang zugeordnet	

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title			Abbreviation
Mobile and Ubiquitous Business			12-M-MUS-262-m01

Module coordinator		Module offered by	
holder of the Chair of Information Systems Engineering		Faculty of Management and Economics	

ECTS	Method of grading	Only after succ. compl. of module(s)	
5	numerical grade	--	

Duration	Module level	Other prerequisites	
1 semester	graduate	--	

Contents

The module provides an overview of technologies and business applications of mobile networks, end devices, applications (including mobile commerce and payment) through to smart objects in a future "Internet of Things". Basic concepts and their use in practice are illustrated using numerous examples. In the accompanying exercise, corresponding case study texts are analyzed and discussed.

Intended learning outcomes

- Understanding the technological foundations and capabilities of mobile and ubiquitous systems and their integration into existing IS infrastructures
- Analyzing business applications in processes, products/services, and business models
- Analysis and evaluation of the operational and strategic implications of such technologies from a management perspective
- Application of the learned concepts to real management challenges based on case studies

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: English
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title		Abbreviation
Organizational Economics and Digital Transformation		12-M-OEDT-262-m01

Module coordinator	Module offered by
holder of the Junior Professorship of Applied Microeconomics, esp. Human-Machine Interaction	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

The course Organizational Economics and Digital Transformation introduces advanced topics in organizational economics, with a focus on economic decision-making within organizations. Concepts and tools from microeconomic theory, as well as empirical findings from field studies and laboratory experiments, are incorporated, such as those related to performance measurement and incentives, organizational structure, and authority. Additionally, the course integrates key aspects of digital transformation shaping modern business landscapes. Thus, students not only gain a solid overview of the fundamental principles of organizational economics but also insights into the challenges, opportunities, and strategies associated with the digital transformation of businesses.

Intended learning outcomes

With this course,
- students will be able to understand and reflect on modern microeconomic concepts and current organizational economics.
- students will learn to master and apply quantitative microeconomic methods.
- students will be enabled to classify and relate specialized knowledge from theoretical microeconomics, experimental and empirical microeconomics, business administration, and psychology.
- students learn how digital transformation impacts organizations and their architecture.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: English
Assessment offered: In the semester in which the course is offered
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: after announcement

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title		Abbreviation
Optimization in Practice		12-M-OIP-262-m01

Module coordinator	Module offered by
--	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	--	--

Contents

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Intended learning outcomes

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Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: English
Assessment offered: In the semester in which the course is offered
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Policy and Management Evaluation Methods	12-M-PEM-262-m01

Module coordinator	Module offered by
holder of the Chair of Data Science in Business and Economics	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

This course offers an introduction to the fundamentals of causal inference and to widely used research designs in the social sciences. In the first part a framework for understanding causality is introduced. Specifically, the epistemological differences between association, intervention and counterfactuals are explained. Then it is shown why experiments are paramount in generating causal knowledge and which assumptions are needed for which level of the causal hierarchy. Finally, we will discuss two widely used approaches to causality in the social sciences, i.e. potential outcomes and directed acyclic graphs.

The second part is devoted to the research designs regressions analysis, difference-in-differences, instrumental variables, and regression discontinuity. The emphasis is how these research designs are for example applied to answer important questions in labour economics such as the effects of a minimum wage increase on employment or the effect of children on female labour supply and wages.

The assumptions each research design requires in order to identify a causal effect will be at center stage of the lecture. Therefore the emphasis is to teach students *what* one needs to estimate in order to answer a given question. Further, the research designs are discussed such that students will be able to evaluate and apply these research designs to other questions and fields.

Intended learning outcomes

At the end of the course, students should be able to understand basic concepts and methods of causal inference, as well as read, interpret, and assess the credibility of scientific publications. In addition, the course serves as preparation for advanced statistics and econometrics courses.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: English
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module appears in
keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Product Innovation and Price Management	12-M-PIPM-262-m01

Module coordinator	Module offered by
holder of the Chair of Business Administration and Marketing	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

"Product Innovation and Price Management" explores the crucial aspects of developing innovative products and effectively managing pricing strategies in dynamic markets. Students will examine theories and practices related to product innovation, market analysis, and pricing methodologies.

Rough course structure:

Innovation management
- Fundamentals of innovation management
- Idea generation & idea concretization
- Concept definition
- Concept evaluation and selection
- Market launch of new products
- Cross-phase approaches to managing the innovation process

Price management

- Basics of price management
- Concepts of classical price theory
- Behavioral basics of pricing policy
- Approaches to price determination (demand-oriented, cost-oriented, competition-oriented)

Intended learning outcomes

The goal of this course is to equip students with the knowledge and skills necessary to drive innovation in product development and effectively manage pricing strategies in dynamic markets.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: English
creditable for bonus

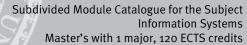**Allocation of places**

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: after announcement

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title		Abbreviation
Project Seminar		12-M-PSI-262-m01

Module coordinator		Module offered by
holder of the Chair of Business Management and Business Information Systems		Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
15	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

The module "Project Seminar," in which students work in small groups on a practice-relevant problem, offers a comprehensive teaching and learning experience that covers various competency areas:
- Students deal with real-life problem situations that come directly from practice. This includes the detailed capture of current states (the present situation) and desired states (the target situation). Additionally, by creating a subject concept, theoretical and practical knowledge is applied in both a documenting and planning manner.
- The module places great emphasis on teaching and applying various project management techniques, including work planning, resource management, and time management.
- In the implementation of the developed subject concepts into an information system solution (IS solution), students practically apply their technical skills. They engage in software development, data management, and possibly aspects of artificial intelligence, depending on the project theme.
- The module also promotes interdisciplinary skills. This particularly includes teamwork, which is essential in this context.

Intended learning outcomes

The "Project Seminar" module aims to achieve the following learning outcomes:
1. Subject-specific Competencies: Students learn to identify and design the current and desired states in subject concepts. They apply this knowledge practically by implementing it in an information system solution (IS solution). Through intensive engagement with realistic problems, students expand their basic knowledge and gain specialized expertise based on current research.
2. Methodological Competencies: Students enhance their problem-solving skills by independently tackling new and complex tasks in a project context and developing flexible solution strategies. They learn important aspects of project management, including planning, organizing, and executing projects within a team context.
3. Practical Professional Competencies: By working on realistic and practice-relevant problems, students can practically apply theoretical knowledge, thereby sharpening their professional skills. Implementing an IS solution allows students to develop technical skills in information technology and system development.
4. Interdisciplinary Competencies: Working in small project groups enhances students' abilities in communication, cooperation, and conflict resolution.

Courses (type, number of weekly contact hours, language — if other than German)

S (2)
Module taught in: German and/or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

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Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Workload
450 h
Teaching cycle
Teaching cycle: each semester
Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title			Abbreviation
Strategic Management of Global Supply Chains			12-M-SMGS-262-m01

Module coordinator		Module offered by	
holder of the Chair of Logistics and Quantitative Methods		Faculty of Management and Economics	

ECTS	Method of grading		Only after succ. compl. of module(s)
5	numerical grade		--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Description:
In the course "Strategic Management of Global Supply Chains", students will become familiar with the basic principles of building an efficient global supply chain and will apply what they have learned working on multiple case studies.

Intended learning outcomes

After completing this course students
(i) can apply the basic methods and concepts of supply chain management to practical settings and evaluate the results, and
(ii) understand the effects of global value chains onto strategic company decisions.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
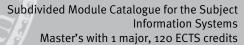Language of assessment: English
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: no courses offered

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title		Abbreviation
Seminar: Master Information Systems		12-M-SMIS-262-m01

Module coordinator	Module offered by
--	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	--	--

Contents

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Intended learning outcomes

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Courses (type, number of weekly contact hours, language — if other than German)

S (2)
Module taught in: German and/or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

portfolio (100 to 150 hours total)
Language of assessment: German and/or English

Allocation of places

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Additional information

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Workload

300 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Topics in Artificial Intelligence	12-M-TAI-262-m01

Module coordinator	Module offered by
Dean of the Faculty of Business Management and Economics	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

This module serves the purpose of transferring credits from
- courses taken at other German or non-German universities
- additional courses offered on a short-term basis
- courses offered by new Chairs that are yet to be included in the FSB (subject-specific provisions)

The holders of the respective Chairs will ensure that the courses are eligible for credit transfer.

Intended learning outcomes

As a result of accrediting multiple kinds of modules, a description of acquired skills cannot be given.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: German and/or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: German and/or English
Assessment offered: In the semester in which the course is offered
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: after announcement

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title			Abbreviation
Topics in Business Analytics			12-M-TBA-262-m01

Module coordinator		Module offered by
Dean of the Faculty of Business Management and Economics		Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

This module serves the purpose of transferring credits from
- courses taken at other German or non-German universities
- additional courses offered on a short-term basis
- courses offered by new Chairs that are yet to be included in the FSB (subject-specific provisions)

The holders of the respective Chairs will ensure that the courses are eligible for credit transfer.

Intended learning outcomes

As a result of accrediting multiple kinds of modules, a description of acquired skills cannot be given.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: German and/or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: German and/or English
Assessment offered: In the semester in which the course is offered
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: after announcement

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title			Abbreviation
Applied Data Analysis and Machine Learning			12-M-TDS-262-m01

Module coordinator		Module offered by	
holder of the Junior Professorship of Microeconomics, esp. Economics of Digitization		Faculty of Management and Economics	

ECTS	Method of grading	Only after succ. compl. of module(s)	
5	numerical grade	--	

Duration	Module level	Other prerequisites	
1 semester	graduate	--	

Contents
Data science is concerned with extracting knowledge and valuable insights from data assets. This course provides an introduction to data science and its application in business and economics. Participants will be familiarized with data handling in Python, data visualization, and various machine learning techniques for prediction and estimation. We will apply the acquired knowledge in topics from business and economics. The course will be divided into two parts: the lecture where the techniques will be taught as well as exercise in which students will be able to work with data on their own.

Intended learning outcomes
In this module, • students learn data handling and visualization in Python. • students are familiarized with the development and evaluation of machine learning models. • students gain an understanding of how to apply the taught techniques to real data sets.

Courses (type, number of weekly contact hours, language — if other than German)
V (2) + Ü (2) Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)
a) written examination (approx. 60 to 120 minutes) or b) portfolio (approx. 50 hours total) Language of assessment: English Assessment offered: In the semester in which the course is offered creditable for bonus

Allocation of places
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Additional information
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Workload
150 h

Teaching cycle
Teaching cycle: summer semester

Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title		Abbreviation
Applied Topics in Data Science in Business and Economics		12-M-TE-262-m01

Module coordinator	Module offered by
holder of the Chair of Data Science in Business and Economics	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

This course aims to equip students with key empirical research methods and their applications in business and economics. The course will cover the development of empirical research ideas, research designs, data generation, data editing, and data analysis. The course will use a paper-based approach to introduce and apply these topics. Additionally, students will learn about existing panel datasets and be led to perform their own empirical research. Students that attend this course should have advanced knowledge in statistics and econometrics.

Intended learning outcomes

By the end of the course, students will have a comprehensive understanding of how to conduct empirical research in business and economics.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: English
Assessment offered: In the semester in which the course is offered
creditable for bonus

Allocation of places

24 places.
WA1:
(1) Should the number of applications exceed the number of available places, places will be allocated by lot among all applicants irrespective of their subjects.
(2) Places on all courses of the module with a restricted number of places will be allocated in the same procedure.
(3) A waiting list will be maintained and places re-allocated by lot as they become available.

Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: each semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title		Abbreviation
Topics in Electronic Business		12-M-TEB-262-m01

Module coordinator	Module offered by
Dean of the Faculty of Business Management and Economics	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

This module serves the purpose of transferring credits from
- courses taken at other German or non-German universities
- additional courses offered on a short-term basis
- courses offered by new Chairs that are yet to be included in the FSB (subject-specific provisions)

The holders of the respective Chairs will ensure that the courses are eligible for credit transfer.

Intended learning outcomes

As a result of accrediting multiple kinds of modules, a description of acquired skills cannot be given.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: German and/or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: German and/or English
Assessment offered: In the semester in which the course is offered
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: after announcement

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title		Abbreviation
Topics in Enterprise Systems		12-M-TES-262-m01

Module coordinator	Module offered by
Dean of the Faculty of Business Management and Economics	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

This module serves the purpose of transferring credits from
- courses taken at other German or non-German universities
- additional courses offered on a short-term basis
- courses offered by new Chairs that are yet to be included in the FSB (subject-specific provisions)

The holders of the respective Chairs will ensure that the courses are eligible for credit transfer.

Intended learning outcomes

As a result of accrediting multiple kinds of modules, a description of acquired skills cannot be given.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: German and/or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: German and/or English
Assessment offered: In the semester in which the course is offered
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: after announcement

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Corporate Entrepreneurship and Innovation	12-M-UGF1-262-m01

Module coordinator	Module offered by
holder of the Chair of Entrepreneurship and Strategy	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

This module is a theory-led and practice-oriented primer on corporate entrepreneurship. It provides you with knowledge useful for anyone aiming at working (or researching) in the field of corporate innovation and entrepreneurship or at pursuing an 'intrapreneurial' or entrepreneurial career.

(1) Introduction to corporate entrepreneurship
(2) Antecedents and forms of corporate entrepreneurship
(3) Corporate strategy and corporate entrepreneurship
(4) Organizational structure and corporate entrepreneurship
(5) Human resource management and corporate entrepreneurship
(6) Building supportive organizational cultures
(7) Entrepreneurial control systems
(8) Entrepreneurial leadership
(9) The corporate entrepreneur as a champion and diplomat
(10) The pay-off from corporate entrepreneurship
(11) Corporate venture capital
(12) Corporate entrepreneurship in nonprofit and government organizations
(13) Universities and academic spin-offs
(14) Wrap-up and Q&A

Intended learning outcomes

Educational aims
- Clarify the role of corporate entrepreneurship
- Explain theoretical concepts and mechanisms behind corporate entrepreneurship
- Enable students to critically appraise alternative approaches to corporate entrepreneurship
- Enable students to evaluate the boundaries and risks of corporate entrepreneurship

Learning outcomes

On successful completion of this module students will be able to:

- Create and evaluate concepts related to corporate entrepreneurship
- Assess the role of corporate entrepreneurship for creating and sustaining competitive advantage
- Make judgements about the organizational and managerial implications of corporate entrepreneurship
- Systematically choose between different routes of action

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
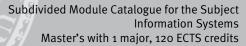Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: English
creditable for bonus

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Allocation of places
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Additional information
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Workload
150 h
Teaching cycle
Teaching cycle: winter semester
Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title		Abbreviation
Corporate Strategy		12-M-UGF2-262-m01

Module coordinator	Module offered by
holder of the Chair of Entrepreneurship and Strategy	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

This theory-led and application-oriented module provides you with critical knowledge and skills related to corporate strategy—essential for anyone aspiring to take on leadership roles in their future career, may it be in the private or public sector. The module goes beyond basic knowledge about strategic management provided by bachelor-level modules.

(1) Developing strategies in pursuit of competitive advantage
(2) Corporate diversification
(3) Vertical integration and outsourcing
(4) Mergers & acquisitions
(5) Dynamic strategies
(6) Cooperative strategies
(7) Corporate spin-offs and spin-outs
(8) Internationalization strategies (I)
(9) Internationalization strategies (II)
(10) Strategic change
(11) Corporate strategies and new technologies
(12) Corporate governance and corporate social responsibility
(13) Corporate communication and crisis management
(14) Wrap-up and Q&A

Intended learning outcomes

Educational aims
- Clarify the role of corporate strategy
- Explain theoretical concepts and mechanisms behind corporate strategy
- Enable students to critically appraise alternative approaches to corporate strategy
- Enable students to evaluate the boundaries and risks of corporate strategy

Learning outcomes

On successful completion of this module students will be able to:

- Assess the role of corporate strategy for creating and sustaining competitive advantage
- Create and evaluate concepts related to corporate strategy
- Make judgements about the organizational and managerial implications of corporate strategy
- Systematically choose between different routes of action

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
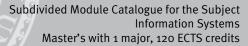Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: English
creditable for bonus

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Allocation of places
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Additional information
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Workload
150 h
Teaching cycle
Teaching cycle: winter semester
Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
keinem Studiengang zugeordnet

UNIVERSITÄT WÜRZBURG
Julius-Maximilians-

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Digital Entrepreneurship and Digital Transformation	12-M-UGF3-262-m01

Module coordinator	Module offered by
holder of the Chair of Entrepreneurship and Strategy	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

This module provides an introduction into digital entrepreneurship and digital transformation.

(1) Introduction
(2) Digital business models
(3) Identifying and exploiting opportunities for digital entrepreneurship
(4) Strategies for creating competitive advantage in digital entrepreneurship
(5) Digital marketing for entrepreneurs
(6) Crowdfunding for entrepreneurs
(7) Design thinking
(8) Lean startup
(9) Platform ecosystems and online communities
(10) Digital strategy and digital transformation
(11) The agile organization
(12) Crowdsourcing
(13) Cyberfraud
(14) Wrap-up and Q&A

Intended learning outcomes

Educational aims: Clarify the role of digital entrepreneurship and digital transformation. Explain theoretical concepts and mechanisms behind digital entrepreneurship and digital transformation. Enable students to critically appraise alternative approaches to digital entrepreneurship and digital transformation. Enable students to evaluate the boundaries and risks of digital entrepreneurship and digital transformation
Learning outcomes: On successful completion of this module students will be able to (1) Assess the role of digital entrepreneurship and digital transformation for creating and sustaining competitive advantage, (2) Create and evaluate concepts related to digital entrepreneurship and digital transformation, (3) Make judgements about the organizational and managerial implications of digital entrepreneurship and digital transformation, (4) Systematically choose between different routes of action.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 to 120 minutes) or
b) portfolio (approx. 50 hours total)
Language of assessment: English
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Teaching cycle
Teaching cycle: summer semester
Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
keinem Studiengang zugeordnet

Subdivided Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

Module title	Abbreviation
Master Thesis Information Systems	12-WI-MA-262-m01

Module coordinator	Module offered by
Dean of the Faculty of Business Management and Economics	Faculty of Management and Economics

ECTS	Method of grading	Only after succ. compl. of module(s)
30	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	Highly recommended: Successful completion of Module 12-M-SMIM (compulsory seminar). If necessary, topic-specific modules as specified by the supervisor.

Contents

Students will complete their degree with a Master's thesis in which they will be required to independently research and write on a topic in the area of business management and economics, drawing on the subject-specific knowledge they have acquired and adhering to the principles of good scientific practice. This thesis may either take the form of an analysis and structured presentation of the existing literature on a certain topic or may, as is often the case, also include a presentation of the students' own original achievements, e. g. new algorithms developed by students, surveys, the prototypical demonstration of a concept they developed or the application and (further) development of a theoretical model.

Intended learning outcomes

In the master thesis students prove that they can plan and carry out a science-based work to solve a particular problem within a specified period autonomously and to document the results in accordance with the professional scientific standards in writing. Students are able to understand relevant contributions to research and professional practice, critically analyze and assess the relevance to their own specific questions. They can assess and recognize major lines of development and dynamics of the subject and therefore also the need to retrain continuously.

Courses (type, number of weekly contact hours, language — if other than German)

No courses assigned to module

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Master's thesis (60 to 80 pages)
Language of assessment: German and/or English

Allocation of places

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Additional information

Time to complete: 6 months

Workload

900 h

Teaching cycle

Teaching cycle: each semester

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

keinem Studiengang zugeordnet